TECHNOLOGY DEPARTMENT

THE PAPER INDUSTRY and PAPER WORLD

AN EDUCATIONAL NEWS MAGAZINE—OCTOBER, 1948

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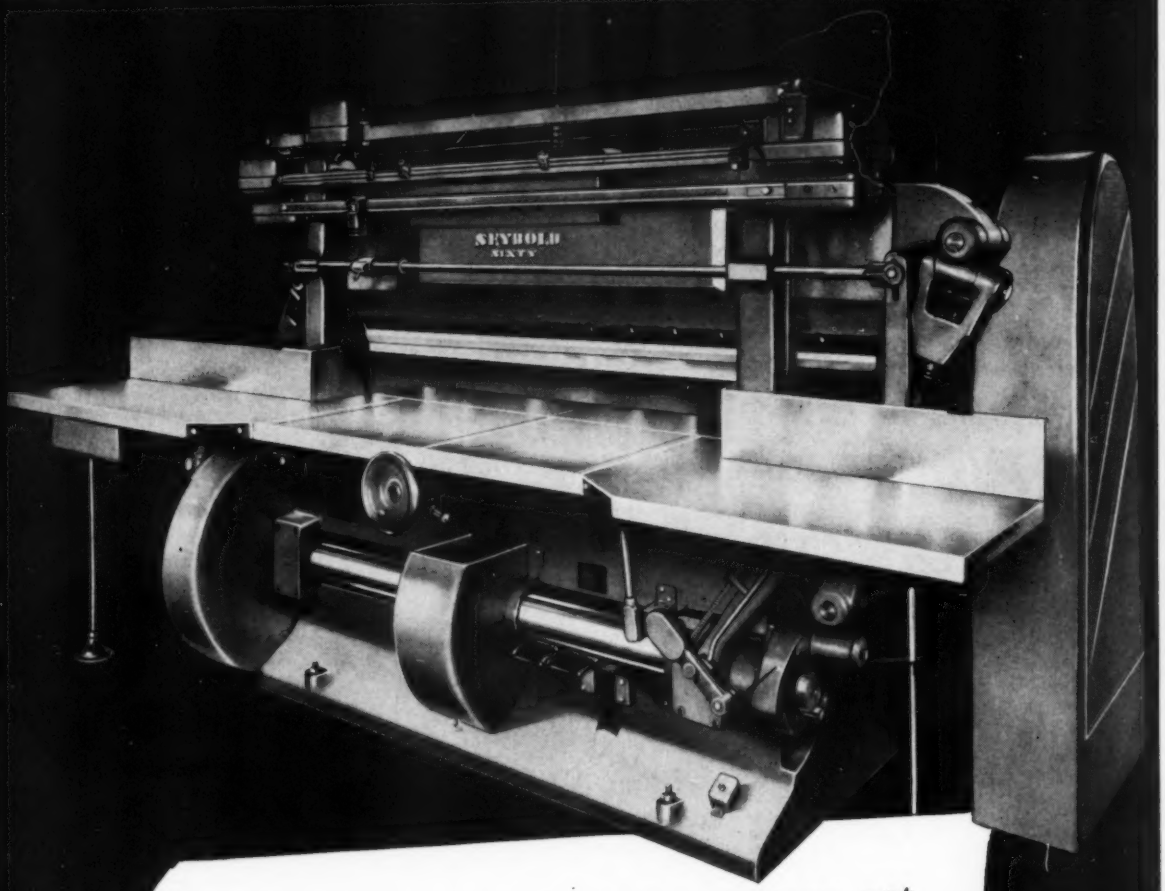
OCT 30 1948
DETROIT

for your papermaking needs, the "Satisfactory" means everything
PATTERSON
SATISFACTORY
MACHINERY
The sum of Satisfactory Performance in grinding of knots, chemical pulp, etc., preparation of fillers and coatings, and agitating, mixing, blending, screening, etc. May we consult with you?
SATISFACTORY PATTERSON MACHINERY

√R v. 30 2 Oct. 1948 - March 1949

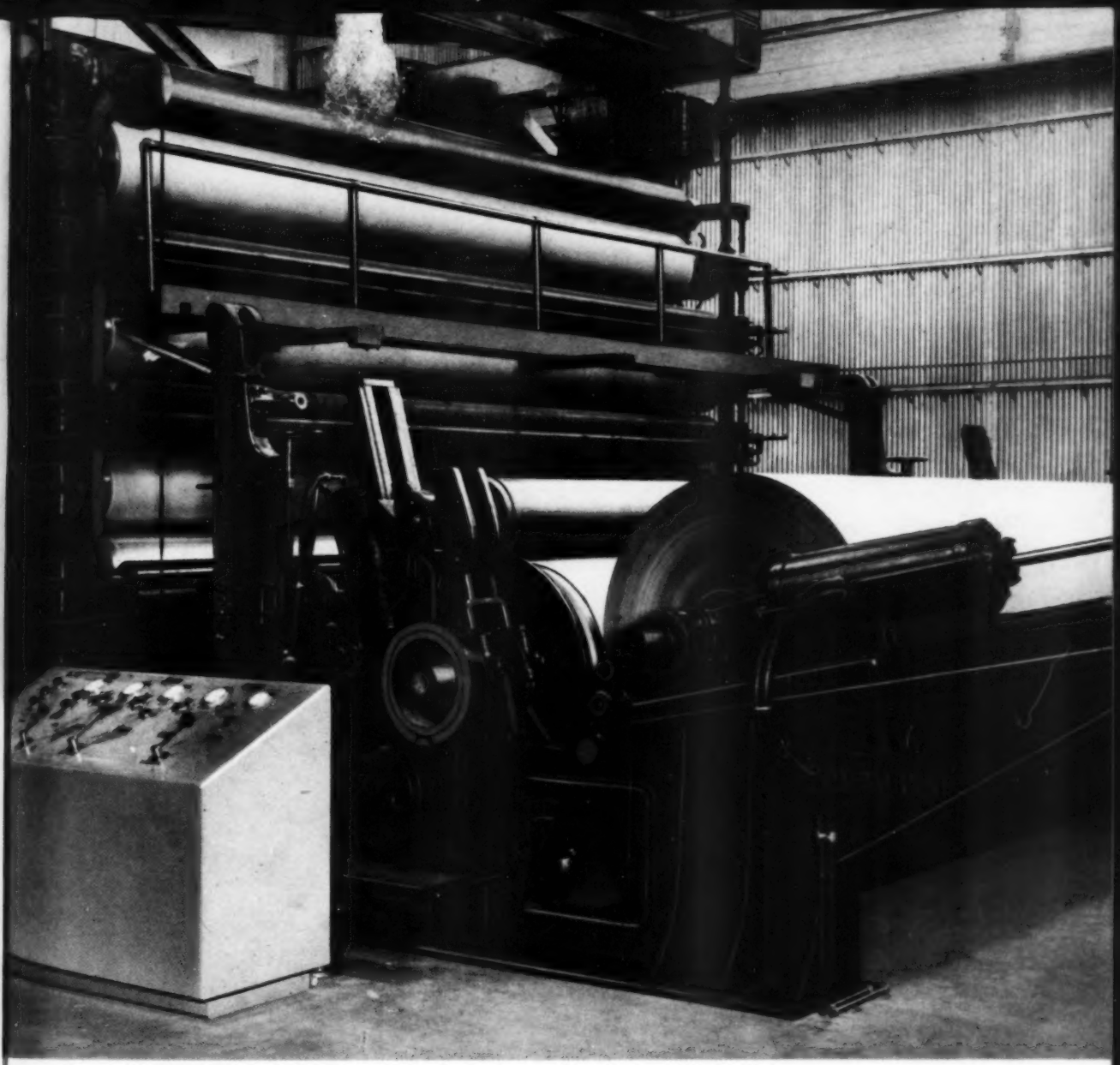


INCREASED MACHINE TONNAGE may not necessarily mean that you must increase the number of trimmers in your finishing room to keep production in balance. Some mills are learning this: *With new Seybold "Sixty" Spacer-Trimmers on the job, actually fewer trimmers are needed to handle more work! And valuable floor space is saved, too.* It will pay you to investigate production records being established by Seybold "Sixty" Mill Spacer-Trimmers.

HARRIS-SEYBOLD

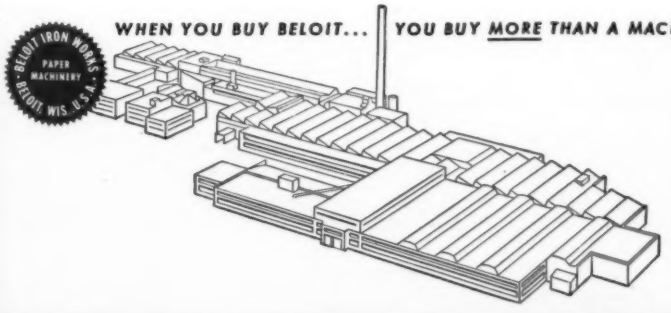
General Offices—Cleveland 5, Ohio

Tech.



Change reels without paper loss

Extra-heavy construction is a feature of this Beloit patented Horizontal Board Reel for rolls up to 84″ in diameter. Reels can be changed without paper loss. Pressure of roll against reel drum is controlled by air cylinders both in starting and winding positions, assuring uniform hardness of rolls. Since 1858, Beloit equipment has helped to set new production records.—*Beloit Iron Works, Beloit, Wisconsin.*



WHEN YOU BUY BELOIT... YOU BUY MORE THAN A MACHINE!

BELOIT

PAPER MACHINERY

HORTON *Elevated Tanks*

for automatic sprinkler service

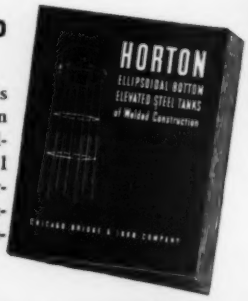
AN automatic sprinkler system will give your plant the best fire protection you can buy, provided the system is backed up by an elevated water tank. Horton all-welded elevated tanks are used to furnish adequate gravity water pressure for sprinkler systems at all times.

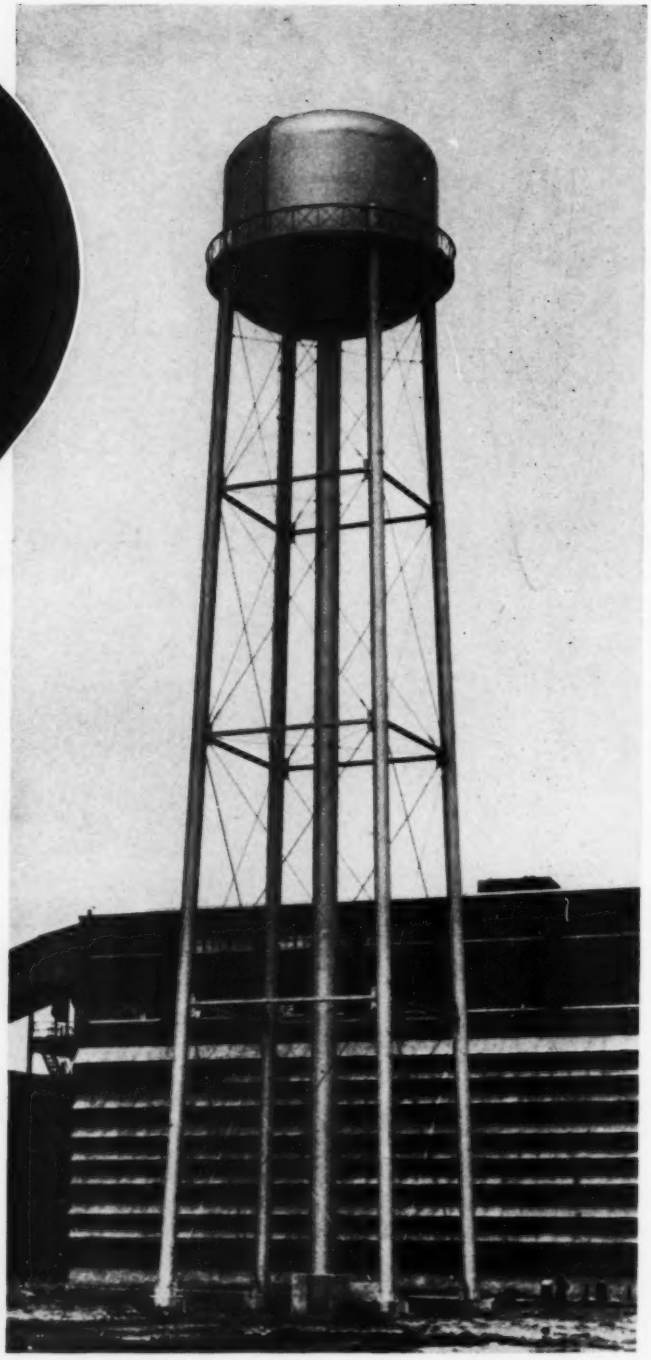
Elevated tanks can be used as the primary source of water, or as a secondary source when there is insufficient pressure in the mains to take care of the required load. In either case, you will have plenty of water available the instant a fire breaks out.

Horton ellipsoidal-bottom elevated tanks are built for use with automatic sprinkler systems in capacities from 40,000 to 500,000 gallons. They can be designed for dual service, to provide water for both general use and fire protection. When this is done, the piping connections are arranged to hold the fire protection water in reserve. If you're planning to install an elevated water tank, write our nearest office outlining your requirements.

HORTON ELEVATED TANK BULLETIN

Write for a copy of this new illustrated bulletin on Horton ellipsoidal-bottom elevated steel tanks. It contains information on the use of elevated tanks for fire protection.





A 100,000-gal. Horton elevated tank erected for the new Southern Paperboard plant at Port Wentworth, Ga. It is an all-welded structure, 125 ft. to bottom, and is used to provide gravity water pressure for sprinkler service.

CHICAGO BRIDGE & IRON COMPANY

Atlanta, 3	2143 Healey Building	Detroit, 26	1546 Lafayette Building	Philadelphia, 3	1653-1700 Walnut Street Building
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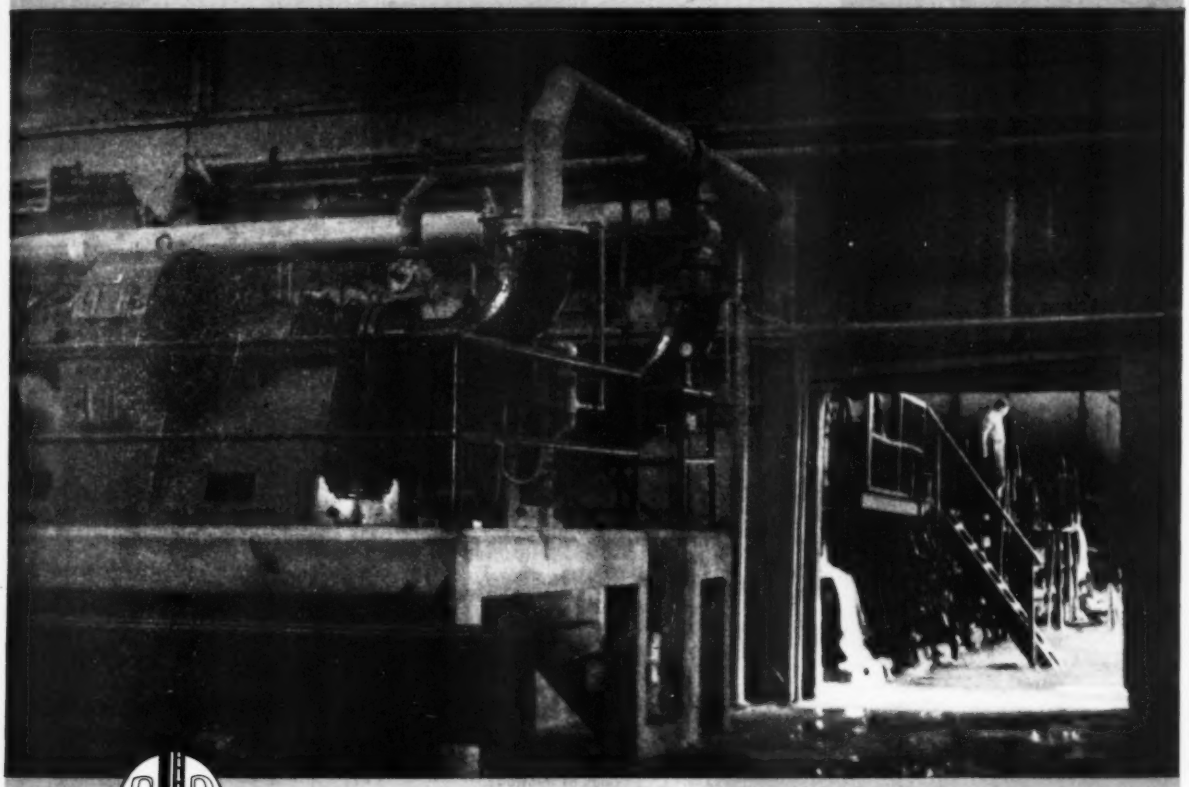
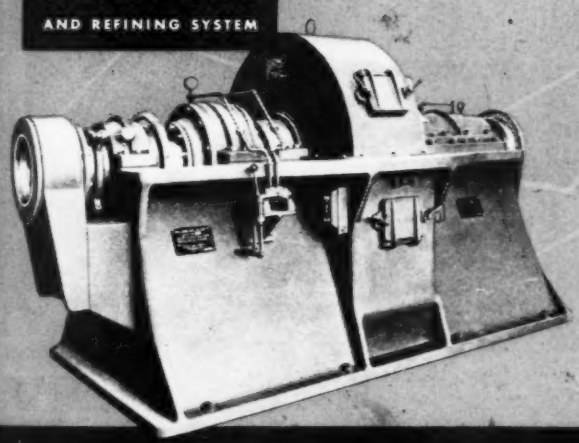
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA. In Canada: HORTON STEEL WORKS, Limited, FORT ERIE, ONT.

Problem

You have just so much power and no more, yet you want more stock for your paper machine in order to get it up to the full capacity made necessary by rising costs.



SUTHERLAND
Continuous BEATING
AND REFINING SYSTEM



Solution

Use your available power more efficiently with Sutherlands. You'll get more stock per H. P. and better stock, too. You'll be amazed at what your paper machine can do, when you give it all the "stuff" it can take. Illustration shows two of four Sutherlands behind one paper machine.

• • •

SUTHERLAND REFINER CORPORATION

TRENTON, NEW JERSEY—*Manufactured in the United States by Valley Iron Works Co., Appleton, Wisconsin*

Sutherland Refiner Limited, 319 Drummond Building, Montreal, P. Q.

SUTHERLAND

DU PONT GREENS
FOR PAPERS
Du Pont Brilliant Green Crystals
Du Pont Naphthol Green B Extra Conc. 125%
Du Pont Victoria Green Small Crystals
Monastral* Fast Green GWD (Pat.)
Pontacyl* Green BL Extra Conc. 200%
Pontacyl* Green NV Extra Conc. 200%
Pontacyl* Green SN Extra
Pontamine* Brilliant Green GX
Pontamine* Green BXN Conc. 150%
Pontamine* Green GX Conc. 125%
These versatile greens may be used as self-shades, and also in mixtures drawing on the wide range of colors from Du Pont standard lines of dyestuffs.
*REG. U. S. PAT. OFF.
What are your specific requirements as to shade . . . fastness . . . application method . . . furnish . . . cost? Whatever your problem may be, there's a Du Pont color which will suit your needs. Our Technical Staff is always ready to assist you. E. I. du Pont de Nemours & Co. (Inc.), Dyestuffs Division, Wilmington 98, Delaware.
DU PONT

THE PAPER INDUSTRY and PAPER WORLD

(Reg. U. S. Pat. Off.)

VOLUME 30 - - - - OCTOBER, 1948 - - - - - - NUMBER 7

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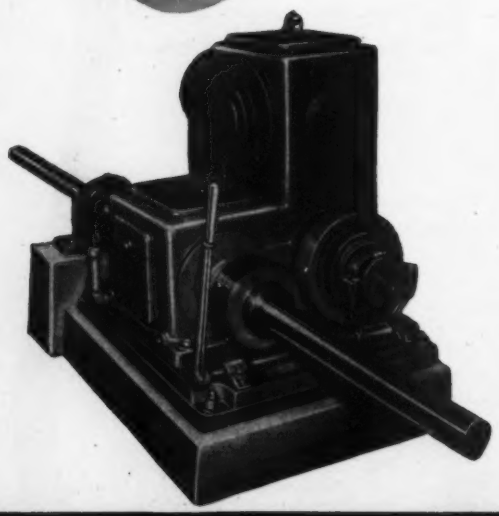
For Increased Production...
For Constant Quality...

SPECIFY **SYCO** DRIVES



SYCO Drive Units provide the modern, mechanical variable speed drive for all sections of your paper machine—give speed control that turns out constant quality paper in *increased* production . . . require less labor, floor space, and power.

Better paper . . . more paper from present machine with precision-built SYCO Drives . . . rugged alloy shafts mounted in accurate anti-friction bearings . . . automatic full-flow lubrication . . . close alignment . . . these factors pay dividends in around-the-clock trouble-free operation.

For new machines, or machines now in service, SYCO Drives are available, easily installed, completely engineered to your exact requirements.

● Write us for full information on SYCO Drives—what they can do on your machine —present or proposed.

See our Representatives — Hotel Commodore, N. Y.

SYCO MANUFACTURING CORP., 324 West Fayette St., SYRACUSE, N.Y.

IF YOU BUY OR SPECIFY CORROSION-RESISTING EQUIPMENT OR CASTINGS...

Engineers and other executives who have anything to do with the purchase or specifications of pumps, valves, pipe, heat exchangers, steam jets, and other corrosive-handling equipment will find this guide an invaluable aid.

Listing 155 corrosives in alphabetical order, it shows which of five well-known DURCO alloys offers most satisfactory resistance to each corrosive. Where two or more alloys are satisfactory for a particular service, selection can be made on the basis of the most economical alloy possessing the required mechanical properties, as shown in a table on page 2.

The alloys discussed are: *DURIRON* and *DURICHLOR*, high silicon irons; *DURIMET 20*, an austenitic stainless steel; *DURCO D-10*, nickel-base alloy; *Chlorimet 3*, nickel-molybdenum-chromium; and *Chlorimet 2*, a nickel-molybdenum alloy.

THE DURIRON CO., INC., DAYTON 1, OHIO

Branch Offices in Principal Cities

you should have a copy of this NEW bulletin

For your free copy of this new bulletin, just fill out the coupon and drop it in the mail.

THE DURIRON CO., Inc., Dayton 1, Ohio

Please send me, without obligation, a copy of your new "Guide to Selection of Durco Corrosion Resisting Alloys."

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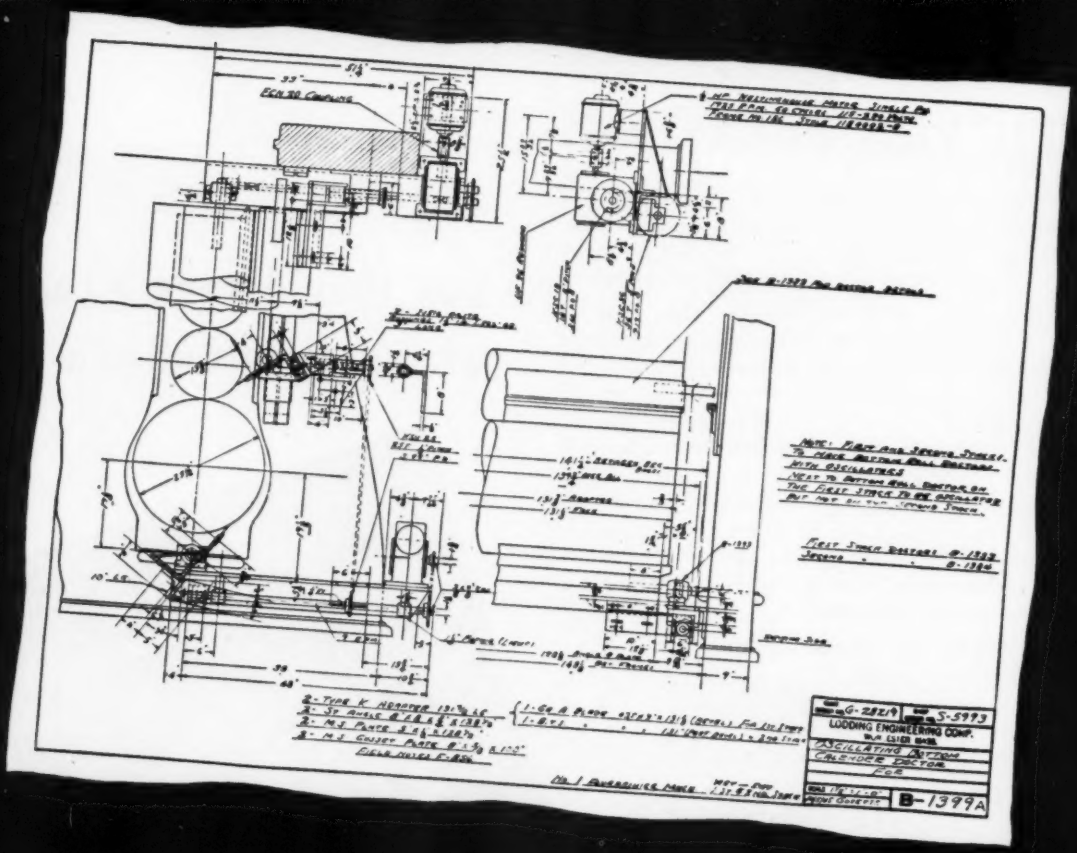
City_____ State_____

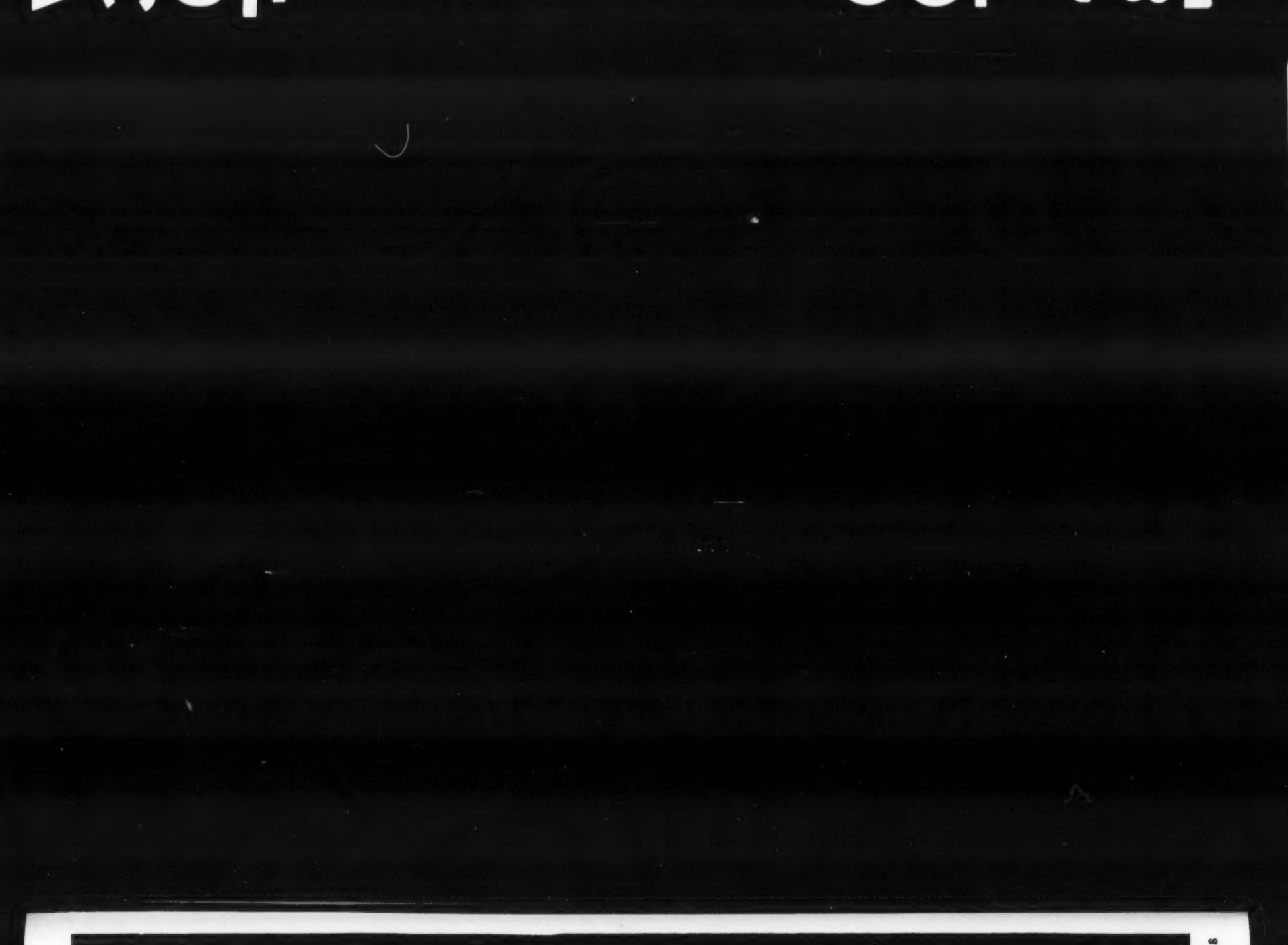
46-GM



ENGINEERED by LODDING

Doctors are important.

You can only afford the best — *custom designed* and *built* by Lodding Engineering Corporation, Worcester, Massachusetts. Represented outside New England by W. E. Greene Corporation, Woolworth Building, New York.



IT'S GOOD BUSINESS TO KEEP 'EM SHINING

There's *profit* as well as pride involved in keeping papermaking rolls continuously clean, smooth and shining. They pay off in terms of better paper and more of it per day at lower cost per ton.

Take a walk through the machine room and look at *your* rolls. If any of them are dull, dirty, streaky, fuzz covered, ask us to give you a layout and estimate on a Vickery Doctor engineered for each individual roll.

BIRD MACHINE COMPANY · SOUTH WALPOLE, MASSACHUSETTS

VICKERY DOCTORS— *Engineered for Every Roll...*

To Insure Cleanliness

This Lukens Nickel-Clad Steel mixing box and regulating dam reduced paper spoilage at Newton Falls (N. Y.) Paper Mill. R. O. Osborn, plant engineer, says of this equipment: "No rust, no dirt and easily cleaned. (They) are giving very satisfactory service".

Nickel gives this paper mill equipment protection against corrosion and product contamination, plus long life and lower maintenance costs. Lukens Nickel-Clad Steel—cladding 10% of total plate thickness permanently bonded to the steel backing plate—provides the equivalent of *solid* nickel protection at the lower cost of *clad* steel.

If your corrosion problem can be solved by nickel, stainless steel, Inconel or Monel, you can enjoy these same economic advantages by specifying Lukens Clad Steels. Lukens offers you Nickel-Clad, Stainless-Clad, Inconel-Clad and Monel-Clad Steels—the widest range available from any source—plates up to 178 inches wide or to over 3 inches thick.

For further information on these corrosion-resistant, moneysaving materials, write for Bulletins 255 and 338. Lukens Steel Company, 408 Lukens Building, Coatesville, Pennsylvania.

CLAD METAL STEEL

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Convention Hall, Philadelphia
October 25 thru 29

LUKENS
Nickel-Clad Stainless-Clad
Inconel-Clad Monel-Clad
STEELS

SOLID METAL ADVANTAGES WITH CLAD STEEL ECONOMY

• • SPEED SCRAP TO THE MILLS TO MAKE MORE STEEL • •

"NEW SERVANTS OF INDUSTRY WITH A BIG FUTURE."
INDUSTRIAL
SOYA PROTEINS
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THE STORY OF THEIR DEVELOPMENT, CHARACTERISTICS AND USES
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EVERY *Paper Mill* SHOULD HAVE THIS NEW FREE BOOK

. . . *Here's Why*

In this fascinating story of those new servants of industry which have such a big future—soya proteins—the emphasis is clearly on paper applications. And of vital importance to every paper mill is the fact that each of these applications of Glidden soya protein materials is one that expedites processing, improves quality, cuts costs or, in some cases, *does all three.*

If you are not yet acquainted with the advantages of Glidden Alpha* Protein and Prosein* as adhesives for pigments in paper coating and of the Glidden Prosize Process for paper sizing . . . write for this book today. It's a concise, yet complete treatment of facts you should have. It's written in interesting, understandable form. And it's *free!*

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Chicago 39, Illinois

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GOULDS USES JET PRINCIPLE . . .

To make New, Better High Pressure, Low Capacity Pump

INDUSTRI-JET

GOULDS has combined a centrifugal and a jet or ejector type pump in one compact unit. This new pump gives you unique advantages in high pressure—low capacity applications.

APPLICATIONS

FOR HANDLING { Cold or Hot Water, Alcohol, Kerosene, Carbon Tetrachloride and similar liquids

General Water Supply
Condensation Return
Filter Press Service
Air Conditioning
Spraying
Boiler Feeding
Booster Service
Air Refrigeration
Hot or Cold Circulating Service

ADVANTAGES

IN PERFORMANCE

1. *Self Priming*—can't vapor lock. Once primed, always primed. The Industri-Jet automatically recovers prime even after suction is exposed to atmosphere.
2. *Built for continuous service.*
3. *Handles both wet and dry liquids.*
4. *Smooth, quiet operation—steady flow.*

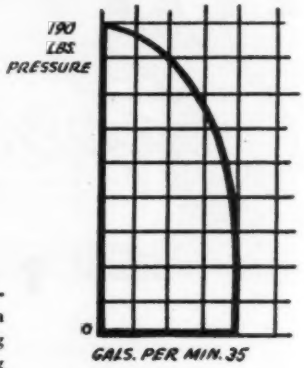
IN MAINTENANCE

1. *Freedom from wear—long life.* Industri-Jet uses the Jet principle for high pressure. There are no close running fits or clearances. The only moving part is the rotating impeller and shaft.
2. *Mechanical seal needs no attention.* Self-Adjusting for wear, requires no lubrication.
3. *Easy to inspect.* Entire pump can be disassembled without disturbing suction or discharge connections.

IN COST

Initial cost is low—and lower still when you consider quality construction and the many operating advantages.

RANGE

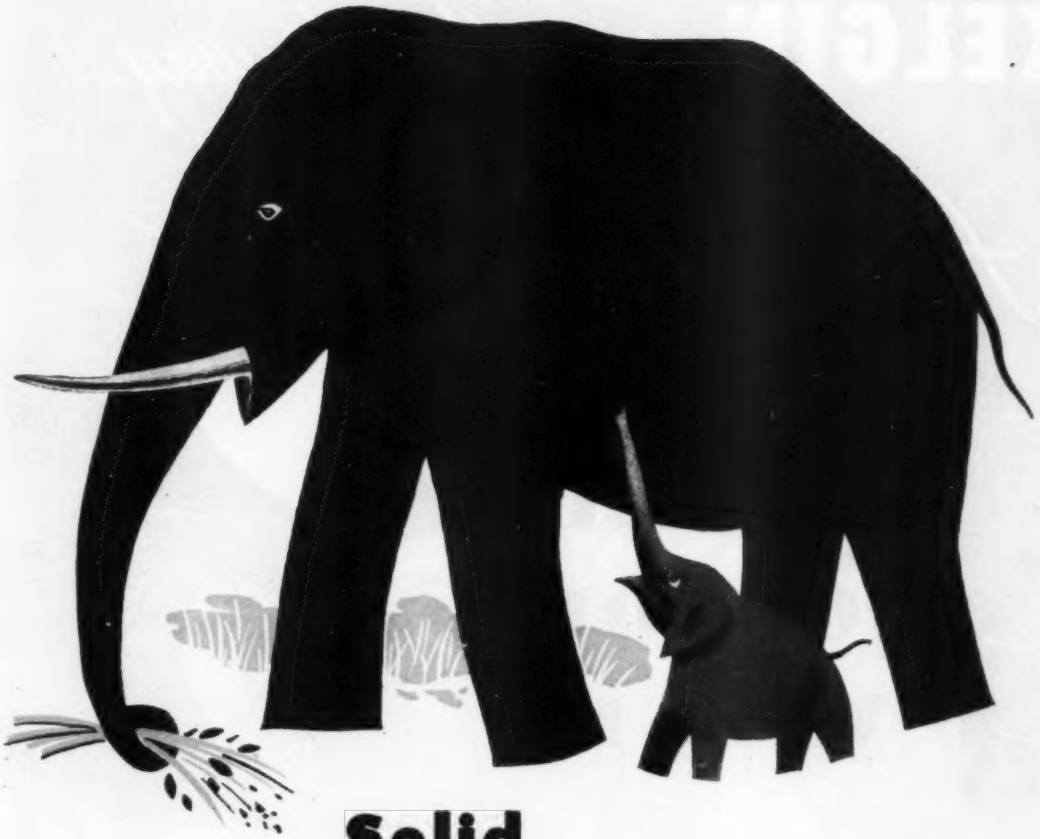


Nine Sizes, ¼ HP to 5 HP
Capacities: to 35 GPM
Pressures: to 190 lbs.

GOULDS PUMPS, INC.

the PUMP FOR the JOB

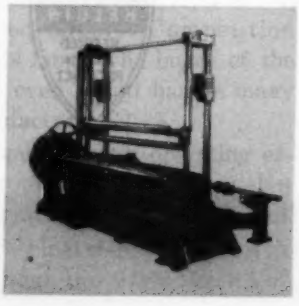
Write Goulds Pumps, Inc., Seneca Falls, N. Y., for complete information on this new pump. Ask for bulletin 630-A1.



Solid

Rolls made on Langston Slitters and Roll Winders are *solid*—tightly wound from core to maximum diameter. You get *clean-cut* rolls, square edged and of uniform density—from any weight or grade of paper or board. There's a type and size for every need.

Samuel M. Langston Company, Camden, New Jersey.



Langston

SLITTERS AND ROLL WINDERS

KELGIN *smoothes the way...*

for

TRUE, FULL COLOR VALUES

Paperboard prepared with Kelgin, the modern algin surface-sizing agent, presents a surface that is uniformly smooth and dense for even penetration of printing inks, oils and waxes. True, full color values, maximum brilliance of high-gloss inks and clean, sharp printing are assured.

Kelgin is easy to handle, dissolves quickly in either hot or cold water. It is adaptable to water box application in the calender stacks — will not produce foaming, picking or sticking to the rolls.

Processed to exacting standards, Kelgin gives precise and unvarying results. You can get full information on its adaptability to your individual surface-sizing application by writing to our Technical Service Department.

KELGIN ... A PRODUCT OF

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The squeeze is on

The paper industry is confronted with the fact that most kinds of paper and paper products are in balanced supply. Competition bares its fangs. The bogey of the "break even" point haunts many a manufacturer.

Obviously, lower operating expense would ease the pressure—but what to do? Call in Moore & White.

More things may be wrought by prayer than this world dreams of, but successful bucking of the law of supply and demand is not one of them. Volume production *at low cost*—a notion to which we are dedicated—is the only known way of licking the problem.

We yearn to translate that notion into terms of Moore & White machinery—in your plant. We can, too! Just slip us the word that you'd like Moore & White engineers to go over your production set-up with a fine tooth comb, and we're on our way. And that without obligation on your part, as the saying goes.

The MOORE & WHITE Company

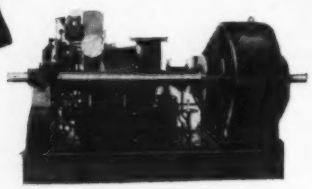
15TH STREET AND LEHIGH AVENUE • PHILADELPHIA 32, PA.

CUSTOM-BUILT MACHINES FOR MAKERS OF PAPER AND PAPERBOARD

3 *Ways To More And Better Paper At Less Cost*

TYPICAL ARRANGEMENTS OF WORTHINGTON STEAM TURBINE PAPER MACHINE DRIVES

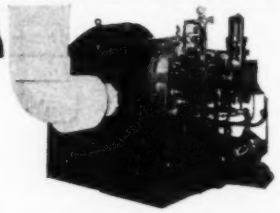
1.



DOUBLE END DRIVE—Extremely compact, ideal for limited space. Also reduces torsion stresses, an advantage when load is increased beyond original plan. Easily fitted into existing setup by removing section of back line shaft connecting each end of drive to line shaft by flexible couplings.

SINGLE END DRIVE—Where required, this type can be direct connected to end of line shaft. Is space-saving, positive-acting and eliminates power losses, maintenance expense and hazards of belted drives.

2.



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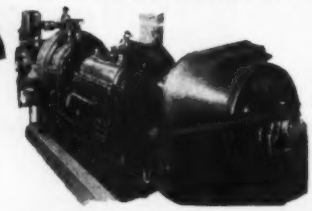
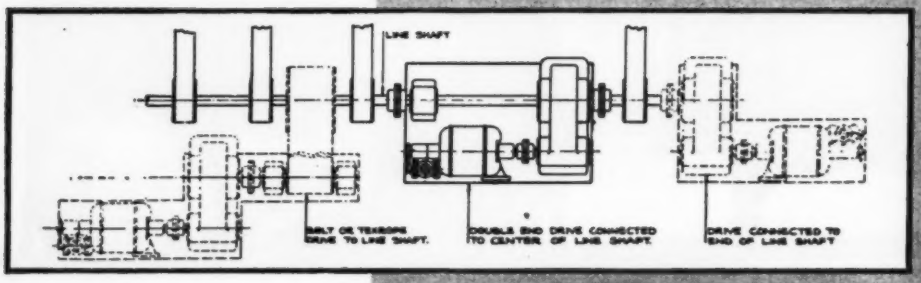


BELTED DRIVE — Furnished wherever conditions require. Units consist of turbine, reduction gear and pulley, on baseplate. Pulley, on separate shaft, is connected to gear by flexible coupling. The most satisfactory drive in many cases, especially with small hp's. Changeover can be made in a few hours.


LINE SHAFT
BELT OR TURBINE DRIVE TO LINE SHAFT.
DOUBLE END DRIVE CONNECTED TO CENTER OF LINE SHAFT.
DRIVE CONNECTED TO END OF LINE SHAFT

Showing how power may be applied at center of line shaft (Double End Drive), at end of shaft (Single End Drive) or by belt (Belted Drive).

Get The Most From Your Machines

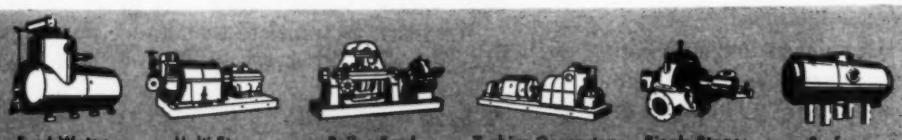
Take advantage of Worthington's long, successful experience in engineering paper machine drives. Get steadier, higher, more accurately controlled speeds, for bigger and better production. Get the efficient design and sturdy construction that assure long, trouble-free, low-cost service . . . And get the facts proving *there's more worth in Worthington.* Write to *Worthington Pump and Machinery Corporation, Steam Turbine Division, Wellsville, N. Y.*

WORTHINGTON

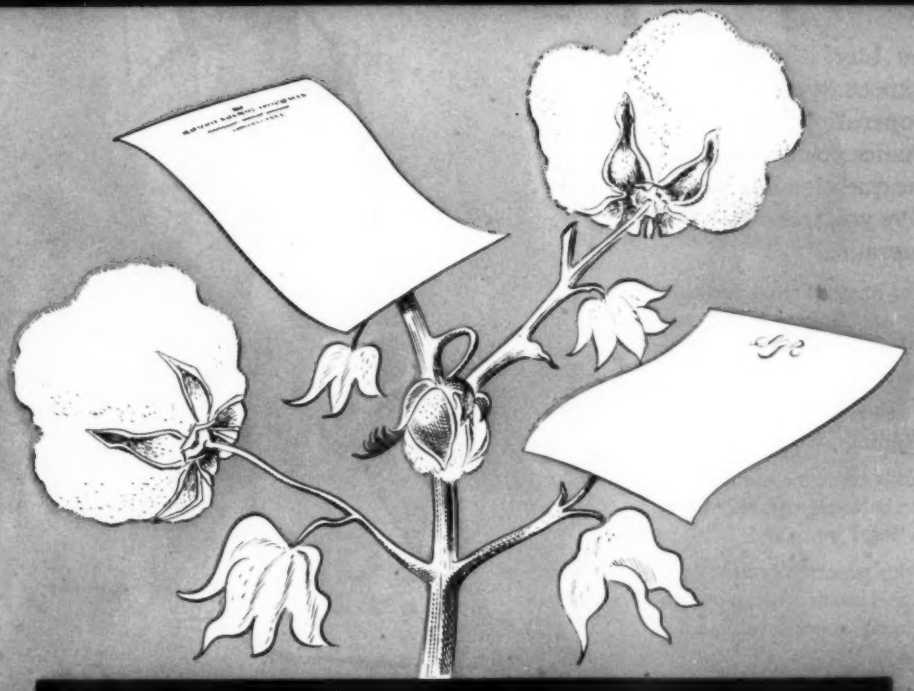
Steam Turbines

78-8

A GREAT TEAM IN STEAM



in high quality paper the trend is to



cotton linters

Good usable cotton rags for papermaking are getting scarcer, more costly every day. But papermakers do not have to accept less satisfactory substitutes. Hercules Bleached Cotton Linters are rapidly gaining acceptance as high quality extenders for rags. Their performance in rag-content writing papers, for example, is well known. Their clean virgin fibers contribute good color, permanence, feel, bulk, opacity, and sheet structure to the paper. Write for helpful technical information on adapting Hercules Bleached Cotton Linters to your paper processing.

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HERCULES POWDER COMPANY

961 King Street, Wilmington 99, Delaware

which pump?

When you buy a pump you naturally expect good service, dependable operation, low power and maintenance costs and other benefits. The question is—which pump will give you these benefits in greater measure?

To help you answer this question read the clear statements about our Company and our products—draw your own conclusions.

1. Warren is backed by 50 years experience in building pumps.

2. Warren builds pumps *exclusively*. Our reputation is based *entirely* upon our ability to build pumps.

3. Warren builds practically *all types* of centrifugal and reciprocating pumps and will engineer special pumps for special purposes.

4. Warren ranks well among pump builders as to size, organization and facilities.

5. Warren bows to no one in selecting the right pump for the job. "A Warren recommendation is never a compromise."

6. Our customers include many of the famous names throughout industry.

7. Warren pumps are fairly priced—but not built to a price. Initial cost is insignificant when measured against results.

8. Warren pumps are guaranteed—not only as to quality and workmanship, but also for performance as rated when shipped. Maintained efficiency is inherent in every Warren design.

Why not put your pump problems up to Warren?

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Reciprocating and Centrifugal

WARREN STEAM PUMP CO., INC., WARREN, MASS.

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SPECIALISTS GET BETTER RESULTS

in cooking...

Aloyco Gate Valve No. 111. This leader of corrosion-resistant valves has double-disc, ball-and-socket type wedges, which are free to rotate and are non-fouling in any position, providing positive closure at all times.

...and in VALVE MANUFACTURE

● High grade restaurants have a tendency to specialize in certain dishes, for which they become famous. This same trend toward specialization has proved its effectiveness in the manufacture of quality valves.

We specialize in one product exclusively—valves for service in corrosive-fluid pipe lines. Concentration in this one field has developed a valuable technological background in this organization that we are glad to place at the service of any manufacturer who has problems relating to valves that must have high corrosion-resistant qualities.

We offer our customers the benefit of long experience in the chemistry of corrosion and contamination, the metallurgy of corrosion-resistant alloys and the designing and manufacturing experience that assures best results in the production of valves that are metallurgically and mechanically correct. Let us discuss your requirements with you.

ALOYCO

STAINLESS STEEL VALVES AND FITTINGS

GATE, GLOBE, Y, CHECK, TANK, SAMPLING AND EXPORT VALVES
SCREWED AND FLANGED FITTINGS

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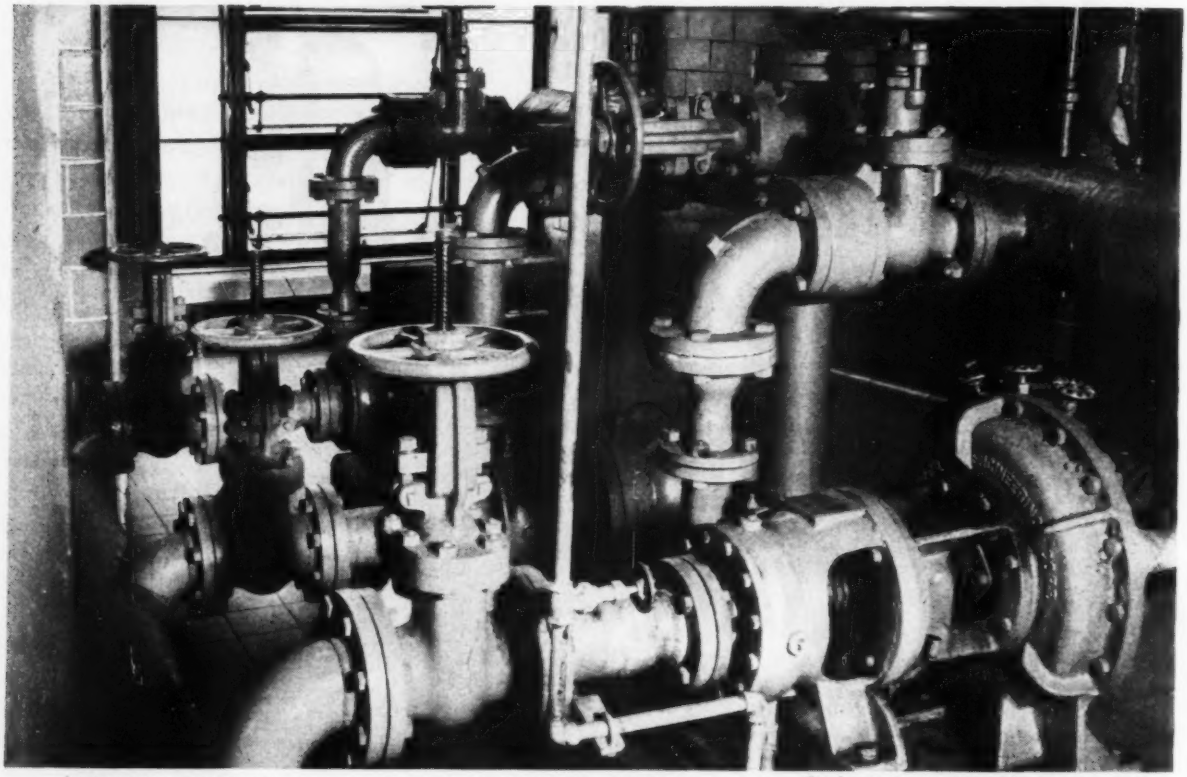
LUNKENHEIMER VALVES Selected For NEW SHERWIN-WILLIAMS POWER PLANT

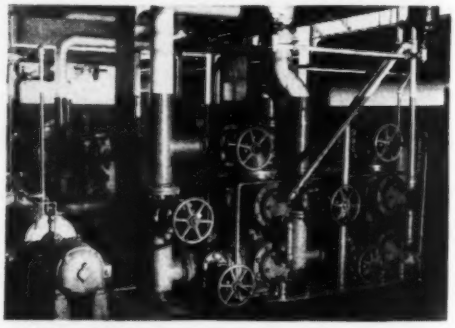


ENGINEERS AND ARCHITECTS: SCHMIDT, GARDEN, AND ERICKSON, CHICAGO

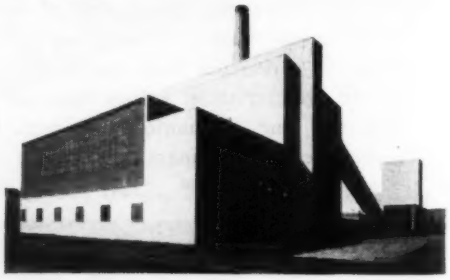
The new power house at Sherwin-Williams' Chicago plant is the last word in efficiency. From the three, 3-drum, bent-tube boilers to the make-up water treatment system, every item of the installation was selected for trouble-free, economical operation. It's only natural therefore, that the list of principal equipment specifies Lunkenheimer Valves.

And so it is in modern plants . . . in a wide cross-section of industry . . . across the country, LUNKENHEIMER VALVES are selected for low-cost operation and dependability. From industrial consultants to operating men, experience with these quality valves proves there is no better valve available.

Feedwater treatment transfer pumps



Air Compressor after-cooler



Whether you're planning a new plant, expansion of present facilities or modernization . . . you can specify Lunkenheimer Valves with utmost confidence. Available through Distributors in all industrial centers.

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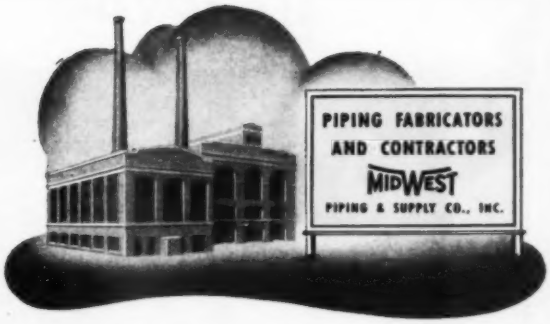

FIRST-HAND EXPERIENCE IN THE FIELD

Helps Maintain the HIGH QUALITY of

MIDWEST

PRE-FABRICATED PIPING

Midwest not only has a pipe fabricating organization of exceptional skill . . . it also has a Construction Department which has been erecting all kinds of piping for 48 years.

As a result, our shops get continuous first-hand field reports on the erection of fabricated piping. Our Construction Department constantly keeps us mindful of the importance of accurate alignment, thorough cleaning, careful inspection and testing of all bends, welded subassemblies, etc., before they leave the shops.

This situation has been of immense value in maintaining the high quality of Midwest Piping. The Construction Department also is the source of countless suggestions for improvement in pressure piping. All Midwest customers benefit from the accumulation of these suggestions.

Midwest, with four fabricating plants strategically located, has nationwide experience in satisfying the piping needs of all industries. You will always find it advantageous to use Midwest Pre-Fabricated Piping . . . either when purchased on the basis of materials only or piping completely installed.

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PIPING FABRICATORS AND CONTRACTORS

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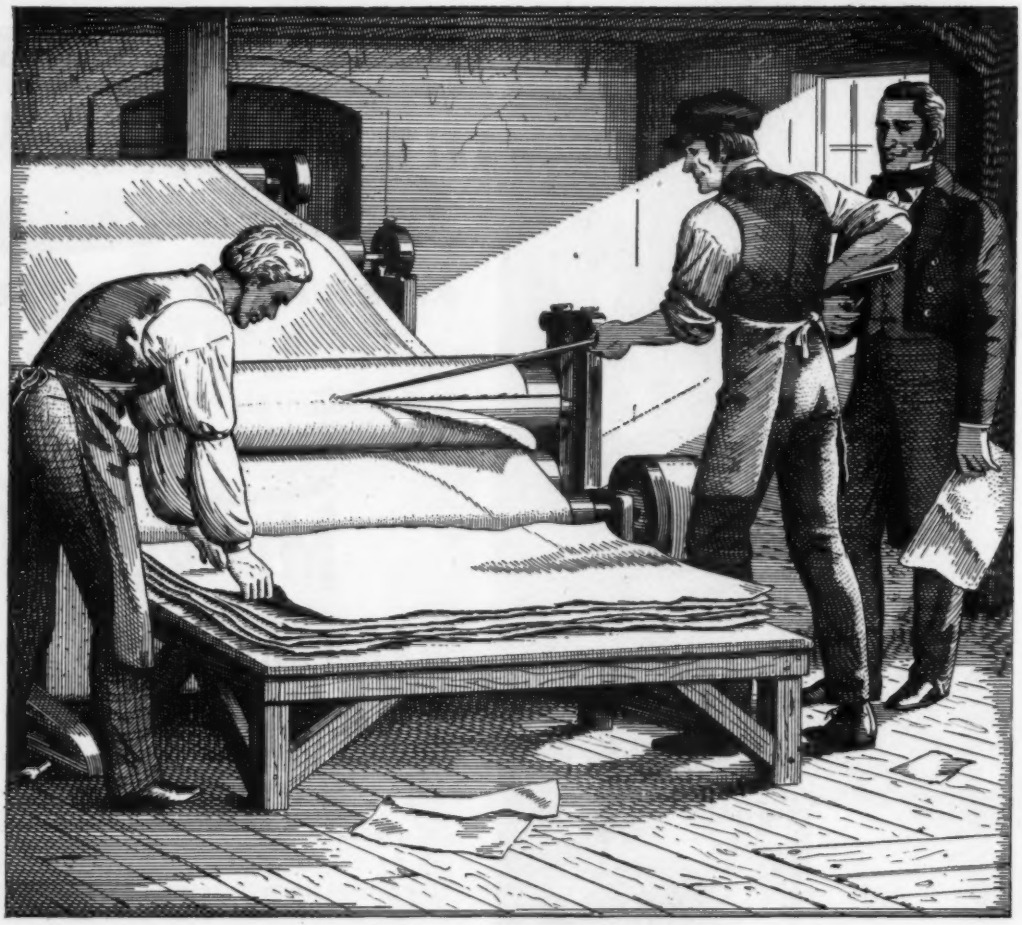

Here Began America's Paper-Board Industry

In 1828, G. A. Shryock, using a pulping process developed by William Magaw, began making wrapping paper from straw in his mill at Chambersburg, Pa. Soon he found that when the paper broke and several wet layers of pulp became wound around the cylinder they formed what he described as a "solid and beautiful binder's board." "Many predicted," he wrote years later, "that these boards would become one of the indispensable products of the world; others said they were not worth as much as the stones in the street."

How right were the former, how wrong the latter, history has long since proved. The boards made in this mill were not only the first successfully made from straw, but they marked the beginning of the vast and essential American paper-board industry of today.

The dramatic story of paper is told in the sound-and-color film, "Paper — Pacemaker of Progress," and in a book under the same title. Both are presented by F. C. Huyck & Sons as a tribute to the Paper Industry. The book will be sent free upon request

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"When you use Simonds, you stay in the Highlands . . . of consistent cutting efficiency"

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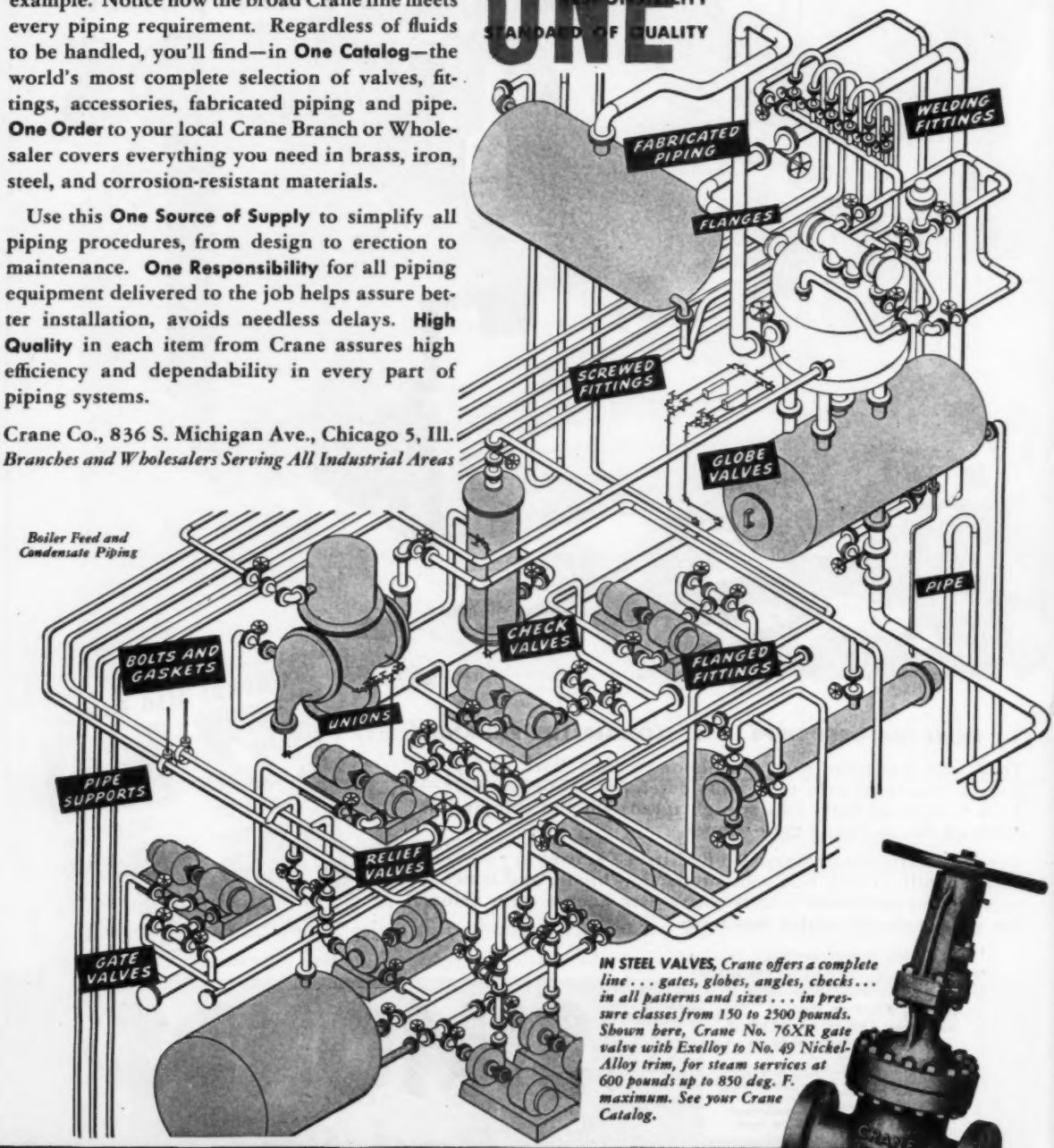
Take This Boiler Feed and Condensate System, for example. Notice how the broad Crane line meets every piping requirement. Regardless of fluids to be handled, you'll find—in **One Catalog**—the world's most complete selection of valves, fittings, accessories, fabricated piping and pipe. **One Order** to your local Crane Branch or Wholesaler covers everything you need in brass, iron, steel, and corrosion-resistant materials.

Use this **One Source of Supply** to simplify all piping procedures, from design to erection to maintenance. **One Responsibility** for all piping equipment delivered to the job helps assure better installation, avoids needless delays. **High Quality** in each item from Crane assures high efficiency and dependability in every part of piping systems.

Crane Co., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas

ONE
SOURCE OF SUPPLY
RESPONSIBILITY
STANDARD OF QUALITY



Boiler Feed and Condensate Piping

IN STEEL VALVES, *Crane offers a complete line . . . gates, globes, angles, checks . . . in all patterns and sizes . . . in pressure classes from 150 to 2500 pounds. Shown here, Crane No. 76XR gate valve with Exelloy to No. 49 Nickel-Alloy trim, for steam services at 600 pounds up to 850 deg. F. maximum. See your Crane Catalog.*

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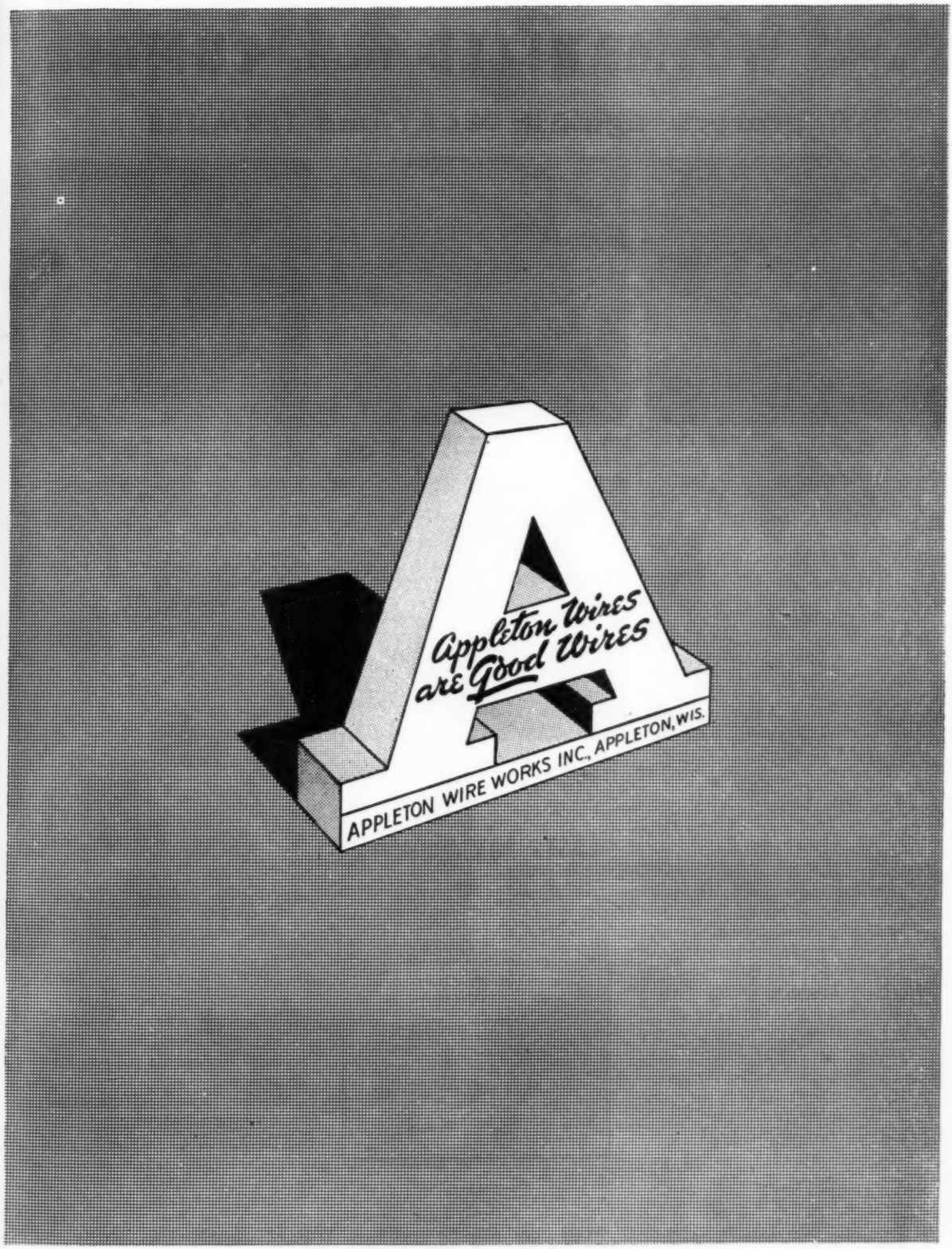

Appleton Wires
are Good Wires
APPLETON WIRE WORKS INC., APPLETON, WIS.

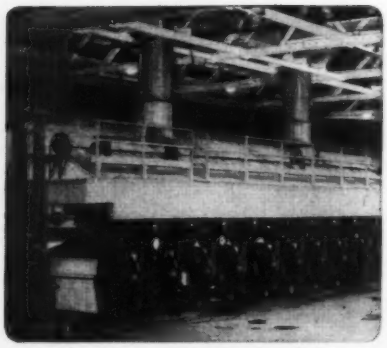
6 common applications

where *WOLMANIZED PRESSURE TREATED LUMBER

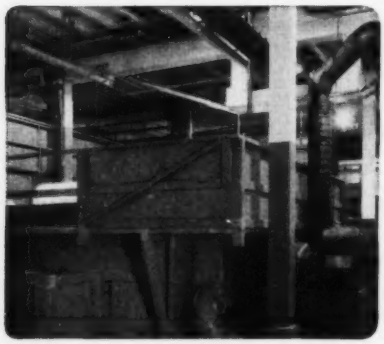
protects against DECAY and TERMITES

1. Ground moisture and rain held in joints, etc., of outdoor structures.

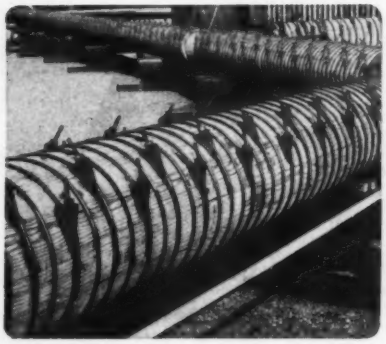
2. Roof decks subject to rapid decay caused by excessive humidity.



3. Where steam and vapor from industrial processes are prevalent.



4. Mixing tanks and equipment exposed to water contact.



5. Where combinations of outdoor exposure and water contact are present.

6. Walls and floors of bins subject to decay caused by moisture condensation.

LASTS FOR DECADES

Imagine the saving in maintenance which you could realize by using lumber which is protected against wood-decay and termites. "Wolmanized" pressure-treated lumber offers just such protection—lasts 3 to 5 times as long as ordinary wood.

Actual service records prove it. Best of all, the extra cost of this pressure-treated lumber is less than the cost of labor alone in replacing prematurely failing, untreated wood.

Learn more about this money saving pressure-treated lumber.

Get all the facts and figures on how Wolmanized pressure treated lumber resists decay and termites.

Write today for this new booklet.

Wolmanized lumber is pressure-treated with salts which are toxic to decay fungi and termites. The treated wood is clean, odorless, paintable and non-corrosive to metals. For lower maintenance costs—sounder buildings—investigate the advantages of using Wolmanized lumber in your building program.

For full factual information, write today to American Lumber & Treating Company.

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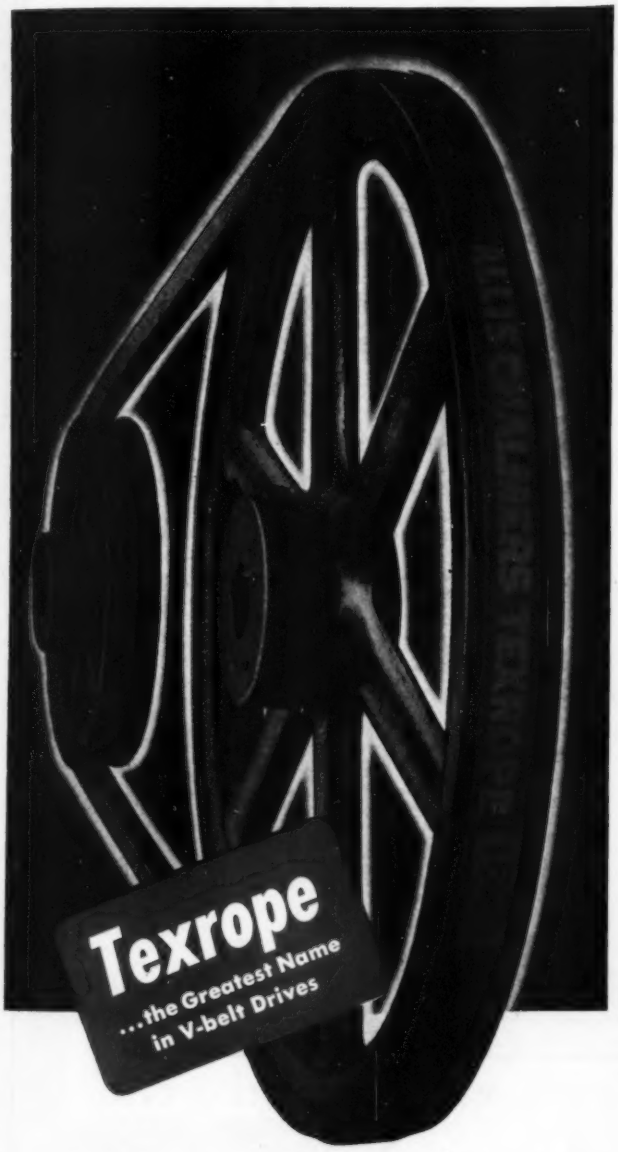
TEXROPE F/HP Drives



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- **AVAILABLE NOW!**
- **CARRY THE NAME "TEXROPE"... AND OVER 25 YEARS OF EXPERIENCE!**

IF YOU'RE IN THE MARKET for fractional horsepower V-belt drives, here are good reasons for investing in TEXROPE — the greatest name in V-belt Drives. 1) They're "engineered" — selected and applied to suit the exact characteristics of your drive. 2) They're in stock at Authorized A-C Dealers or available promptly through A-C District Offices, and 3) They're backed by the greatest collection of V-belt drive experience and facilities of any company in this business.

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High density cast iron. Accurately bored for easy fit with tight shaft grip. Precision grooved for non-slip power and longer belt life. Carefully balanced for vibrationless operation at all speeds.

TEXROPE F/HP V-BELTS

Best known name in V-belts. Carry full rated load with plenty of overload and shock load capacity. Molded to fit sheave groove and grip tightly without excess wear or wasted power. An ideal teammate for Tex-Iron sheaves. Highly efficient on present sheaves, too.

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Super-7 V-belts	5 types . . . sizes to suit every power transmission job
Sheaves, Tex-Iron, Single-Groove	Sheaves in a full range of sizes and grooves
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Texrope Super-7 V-belts result from the cooperative research of Allis-Chalmers and B. F. Goodrich; and are sold only by A-C dealers and offices.

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Originators of the Multiple V-belt Drive for Industry

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THE American DIESELECTRIC

A Revolutionary New Locomotive Crane!

When you read that the American DIESELECTRIC pays for itself in five years, you have every right to be skeptical. Yet we ask only an opportunity to show you actual figures, based on long term job tests. Obviously, this locomotive crane is something new and *different*. It uses direct-diesel power for hoisting and slewing; electric power for traction. Want details? Mail the coupon below.

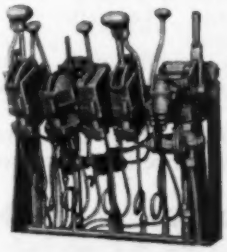
DIESEL-ELECTRIC LOCOMOTIVE CRANE. PATENT NO. 2383468. TOUCH CONTROL. PATENT NO. 2370856.

American Hoist
and DERRICK COMPANY
St. Paul 1, Minnesota

Plant No. 2: So. KEARNY, N. J.
Sales Offices: NEW YORK • CHICAGO PITTSBURGH • NEW ORLEANS SAN FRANCISCO

Graduated AIR CONTROLS!

● With ordinary old-style air controls, any crane is subjected to continuous slams and bangs... a result of "snap" action clutches. In the DIESELECTRIC this action is graduated. Every motion of the crane—hoisting, slewing, live-boom action, travel, load pick-up and load release—can now be made in any desired degree at any desired speed, smoothly and precisely. Also, any or all motions can be simultaneous. Result: less fatigue, more work output.



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St. Paul 1, Minnesota

Please send Catalog 600-L-4, describing the American DIESELECTRIC Locomotive Crane.

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THE six Midwest automatics shown above are beating 3 to 5 times as much stock as the same number of ordinary beaters could ever hope to beat—approximately 50 tons each—enough for five machines running specialties.

Each of the first five beaters is serving a particular machine and each is processing a furnish that is an exact duplicate of a previous "master" furnish because all furnishes are automatically controlled. The sixth beater is being used as a spare.

Because one automatic can do the work of several conventional beaters—and because most of the power is used for work rather than just for circulating the stock around the tub—the saving on power is truly impressive.

It may be customary to use 3 to 5 beaters ahead of an average machine—112" or 116", let us say—but it is not at all necessary. One Midwest automatic will with ease beat enough stock for any 112" or 116" machine.

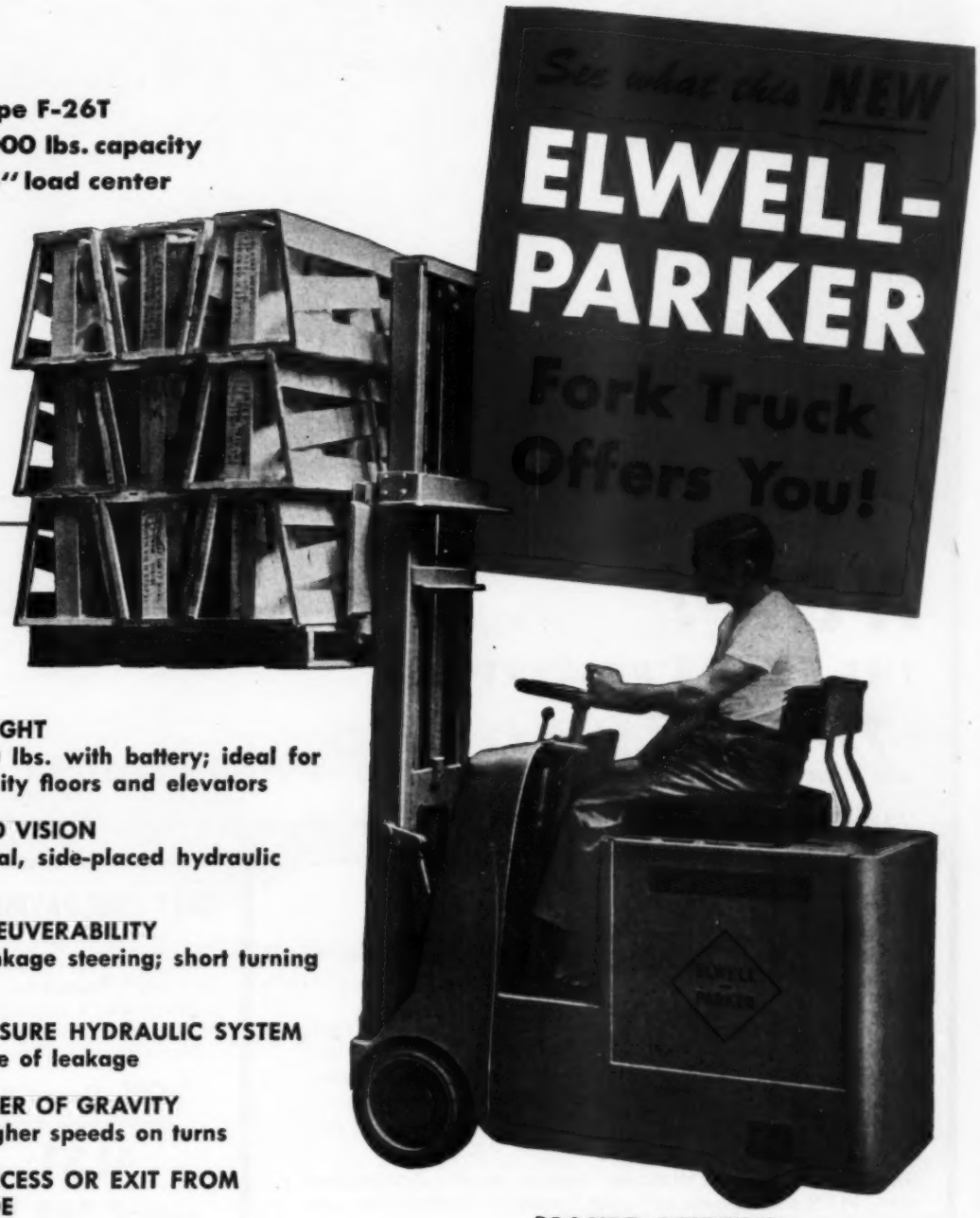
It is costly to install and maintain several ordinary beaters. It is less costly to install one automatic—and history shows that maintenance is very negligible.

WRITE FOR DETAILED DESCRIPTION OF THIS MIDWEST AUTOMATIC HIGH-PRECISION INSTALLATION.

THE MIDWEST-FULTON MACHINE CO., DAYTON 1, OHIO

Midwest - Fulton

Type F-26T
2000 lbs. capacity
24" load center



LIGHT WEIGHT
only 4550 lbs. with battery; ideal for low capacity floors and elevators

IMPROVED VISION
due to dual, side-placed hydraulic cylinders

TOP MANEUVERABILITY
straight linkage steering; short turning radius

LOW PRESSURE HYDRAULIC SYSTEM
less chance of leakage

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ADAPTABLE FOR SPECIAL LOAD HANDLING DEVICES

AIR FOAM, FORM FITTING SEAT

LESS COUNTERWEIGHTING

HYDRAULIC SAFETY VALVES CONTROL LIFT & LOWERING

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PROMPT DELIVERY

WHY? Elwell-Parker has produced this new low-capacity fork truck in view of ever increasing costs of common labor. Model F-26T is the latest member of the EPE "AIR RIGHTS" Series. The Elwell-Parker Electric Company, 4241 St. Clair Avenue, Cleveland 14, Ohio.

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POWER INDUSTRIAL TRUCKS

Soft woods, or hard woods, the Disston 12 H.P. Chain Saw takes them all in stride.

NEW!

THE *EXTRA* POWERFUL

DISSTON 12 H.P. *HEAVY-DUTY*

TWO-MAN CHAIN SAW with Mercury Gasoline Engine

Put this husky Disston Chain Saw to work on your toughest timber-cutting jobs. See how fast it gets them done. Note how smoothly the saw cuts through knots and wet, frozen or abrasive woods. It's built specially for work like that . . . with extra reserve power and extra ruggedness for dependable performance in ALL heavy-duty felling and bucking operations.

This new model retains all the fine qualities of other Disston chain saws, PLUS added power and other features to further boost your production and cut costs. To name a few:

New 12-hp., 2-cycle, 2-cylinder engine . . . an abundance of power.

New—Quick-Detachable Tail Stock.

New Guide Rail.

New Transmission . . . with more rugged housing to withstand rough treatment.

New Abutment Plate . . . shape provides additional protection for transmission by *keeping saw out* from under a bucking cut.

Write for full particulars and name of nearest dealer.

WHEN YOU BUY A DISSTON PRODUCT YOU BUY DISSTON STEEL SKILL and SERVICE

EASY TIME PAYMENT PLAN

(Available only in U.S.A.)

The Disston Time Payment Plan, serviced by Walter E. Heller & Co., installment experts, provides a sound, generous, easy-to-pay method of financing the purchase of a Disston Heavy-Duty Two-Man Chain Saw.

20% Down Payment
(For 36" Model at Present Prices)

$131 DOWN

APPROX. $48 PER MONTH

12 MONTHS TO PAY

AUTHORIZED DEALERS and CERTIFIED SERVICE STATIONS

from coast to coast always ready to serve you. Let your dealer show you how easy it is to own one of these profit making saws . . . how easy it is to pay.

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This "greatest step forward in the felt field in 40 years"—quoting a superintendent—is fully borne out by the following:

Practically every grade of paper and board, from tissues on up to boxboard and roofing felt, has been produced with Orr-Chem felts. And the felts behaved better and lasted longer than the felts previously used, regardless of type or size.

Especially important to mills operating on an employee cooperative program is the time saved by reducing or entirely eliminating production losses due to wash ups; also the sharp reduction in per ton felt costs due to longer felt wears. Both increase the profit and both fatten the payroll. There are Orr-Chems to meet any need.

Untreated bottom felt after term on machine, very much worn.

Orr-Chem on same machine after "use"—felt still in good shape.

THE ORR FELT & BLANKET CO., PIQUA, OHIO

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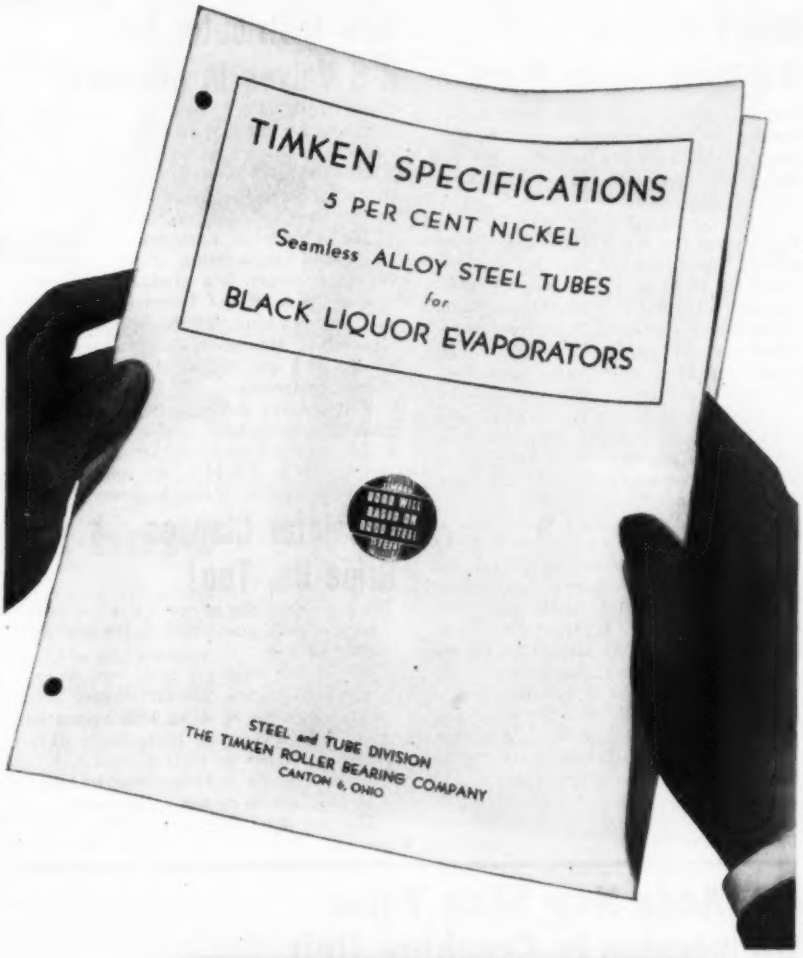
1948

Everything you get in Timken® 5% nickel tubes is AN OPEN BOOK!

NO need for guesswork when you buy your next black liquor evaporator tubes. These specifications for Timken 5% nickel tubes tell you exactly what you're going to get, including chemical composition, physical properties, tolerances and inspection methods.

Because Timken 5% nickel tubes are guaranteed to meet every one of these specifications they give you maximum tube life per dollar invested. They help you cut the cost of black liquor corrosion by (1) reducing downtime, (2) lowering tube replacement costs and (3) minimizing tube sheet wear.

If you want to buy your next evaporator tubes with your eyes open, write today for your copy of Timken Specifications for 5% nickel tubes. Write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".



YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing

R-S valvEvents

ISSUED PERIODICALLY BY R-S PRODUCTS CORPORATION, PHILADELPHIA 44, PA., FOR THOSE CONCERNED WITH FLOW CONTROL AND SHUT-OFF

Now Tulsa Can Water its Lawns Again

Fred Gibson, Philadelphia truck driver, made it to Tulsa in 4 days from the R-S plant in Philadelphia with two big 60-inch R-S Valves riding out back on his truck.

These completed a shipment of 5 big R-S Valves for the Tulsa water supply system. The others are 54-inch valves.

All are R-S cast iron valves, cylinder-operated in connection with liquid level control for water service. All have handwheel and declutching unit for manual control. Angular seated vanes are lapped in for wedge-type closure.

Tulsa and surrounding areas have been suffering from a water shortage, now corrected by the new flow through the big R-S Valves controlling the new Spavinaw flow line which will deliver 35,000,000 gallons daily.

The movement and installation of the big valves was a carefully organized job. Because of speed required, full double crews were assigned so work could proceed day and night. All crews were carefully schooled in each step of procedure and in the sequence of operations.

Annyhoo, the new lines will soon be in operation; the big R-S Valves doing their stuff as usual, and Tulsa's citizens will be free of the irksome water shortage.

This is another example of the growing popularity of R-S Valves in all sizes including the largest.

New Distributor for R-S Valves in Cincinnati

The Henry P. Thompson Company, Schmidt Building, Cincinnati 2, Ohio have been appointed to represent R-S Valves in the Cincinnati area. Their territory includes Southwest Ohio, Southeast Indiana, and part of Kentucky.

The Thompson Company is an old established engineering firm. Herbert N. Haas, owner, is a graduate engineer of the University of Pennsylvania. Associated with him are John S. Bower and Kenneth C. Matthews, also graduate engineers. All are thoroughly schooled in valve engineering.

Today every R-S unit is properly engineered throughout under recognized standards for various industries such as A.S.A., A.P.I., A.S.M.E., etc. and backed up in the field by Valve Engineers.

Escalator Clauses Gripe Us, Too!

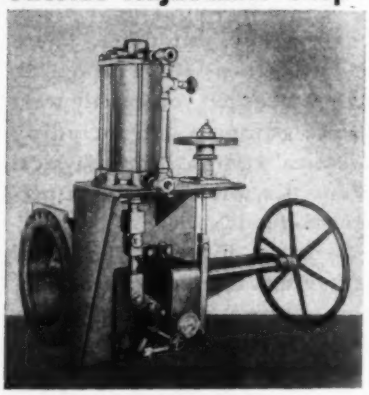
We don't even like to put one in our own contracts with customers, but wotta we gonna do?

All in one week pig iron, iron scrap, steel plate, nickel, electric motors and accessories went up from 10% to nearly 20%. All suppliers of these items have escalator clauses in their contracts.

Naturally, we have one too, to make it possible for us to stay in business.

But we don't like it any better than you do!

R-S Valve features NEW Outside Adjustable Stop



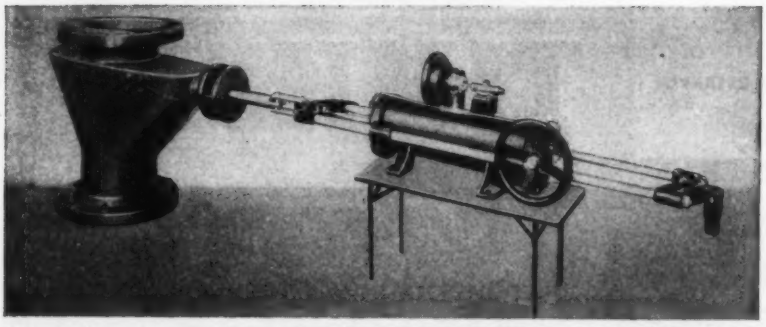
Picture shows R-S Valve #714, a 20-inch 125-pound valve with the R-S Rubber Spool (patent pending) for positive shut-off. Control is by air cylinder, cushioned at both ends. Handwheel and declutching unit are provided.

An outside adjustable stop supplies an auxiliary air cushion and may be set to control maximum opening of vane at any point from 50% to 100% open. This vane moves from full open to full closed position in 1 second.

Operating mechanism can be timed for slow movement if desired by adjusting snubbing valve in air-supply line to cylinder.

Large cylinder can be supplied for air, oil, or water pressure as actuating medium. High speed is normally provided with air only.

R-S Adds New Slide Valve for service in Cracking Unit



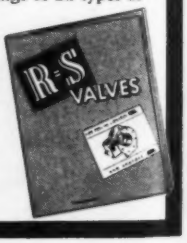
Shown above is a welded steel slide-valve, R-S #713, for handling high temperature catalyst in a cracking unit for petroleum service.

The valve is fitted with Series 30 300-pound American Standard ring-joint flanges. It is delivered complete with air-cylinder positioner and auxiliary handwheel control.

This R-S Valve is available with other types of automatic controls or with manual operator only, if desired.

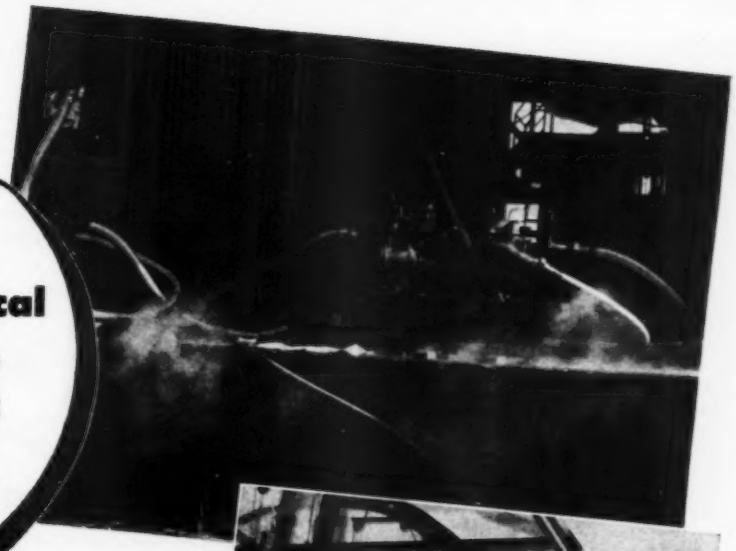
The New R-S Valve Catalog #17

R-S Valve Catalog #17 is packed with information for engineers. There are over 70 halftone pictures of R-S Valves . . . working drawings of 21 types of R-S Valves with standard controls and fittings and complete dimensional data for all sizes . . . working drawings of 22 types of prime movers . . . numerous other diagrams, graphs and miscellaneous drawings. Address R-S Products Corporation, Valve Division, Philadelphia 44, Pa.



JM Less $5

Here is the dependable, economical flexible metal hose for a wide range of applications



REX-TUBE

convoluted flexible metal hose

Where adaptability, durability and economy must be considered in the selection of flexible metal hose, CMH Rex-Tube should be the answer. Rex-Tube is made in eight basic wall formations for countless applications from protective conduit to conveying steam and liquids. Types of construction include square locked, double groove (ball bearing design) and fully interlocked. A variety of base metals and choice of packings are available. Couplings are available for each hose type as required. Write for complete information and specification sheets on the hose type best suited to your requirements.

Rex-Tube is one of the *basic types* of CMH's extensive line of flexible metal hose products.

A FEW OF THE MANY REX-TUBE APPLICATIONS

Conduit • Capillary Casing • Ducting • Exhaust Tubing • Low to Moderate Pressure Oil and Steam Lines • Vacuum Tubing • General Utility

"FLEXON" identifies CMH products, which have served industry for more than 45 years.

"the science of FLEXONICS . . ."the controlled bending of thin metals for use under varying conditions of temperature, pressure, vibration and corrosion" . . . is exemplified in the basic products of Chicago Metal Hose Corporation.

CMH FLEXIBLE METAL HOSE

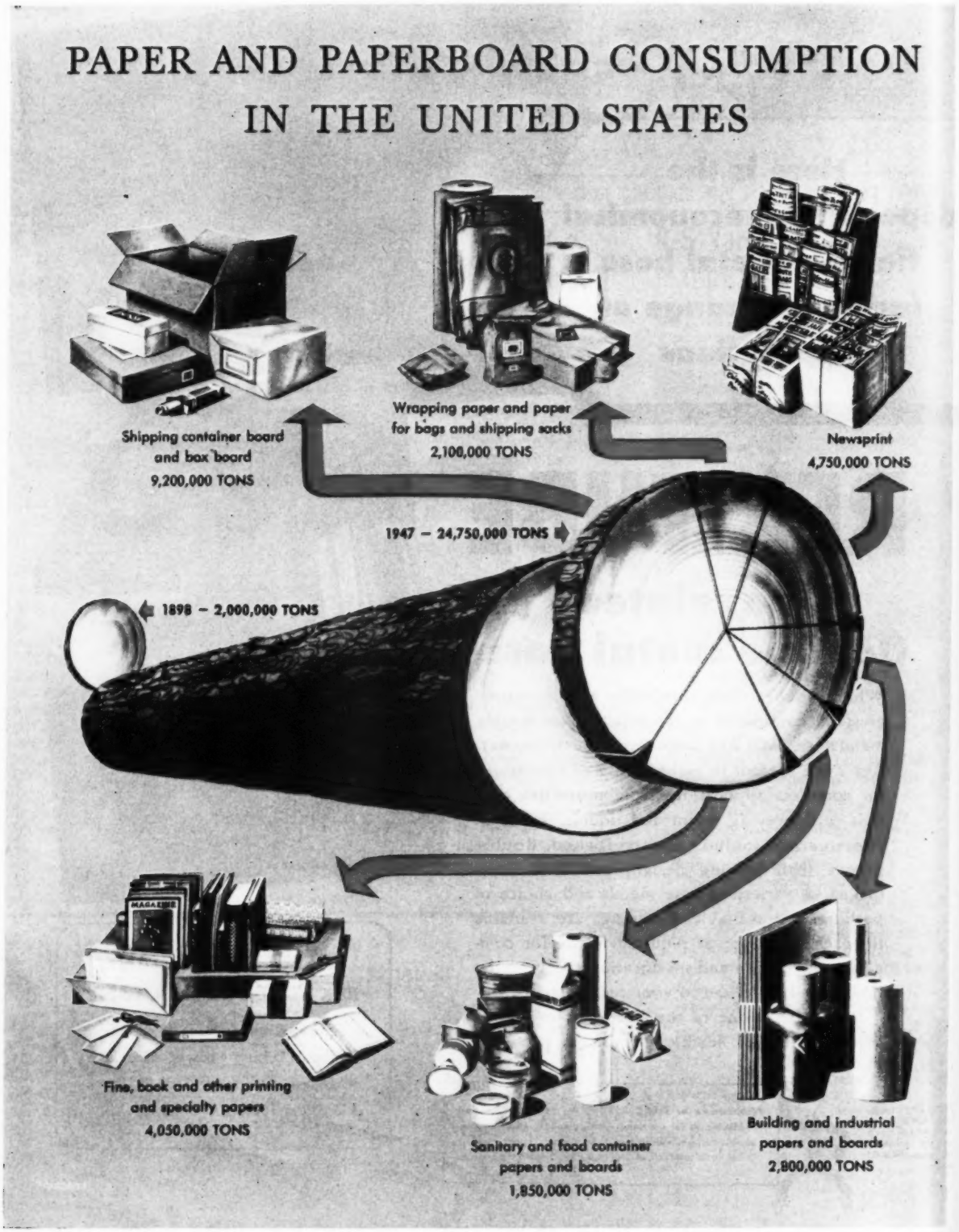
CHICAGO METAL HOSE CORPORATION

Maywood, Illinois

Plants at Maywood, Elgin and Rock Falls, Illinois

In Canada: Canadian Metal Hose Co., Ltd., Brampton, Ontario

PAPER AND PAPERBOARD CONSUMPTION IN THE UNITED STATES


Shipping container board and box board
9,200,000 TONS
Wrapping paper and paper for bags and shipping sacks
2,100,000 TONS
Newsprint
4,750,000 TONS
1947 – 24,750,000 TONS
1898 – 2,000,000 TONS
Fine, book and other printing and specialty papers
4,050,000 TONS
Sanitary and food container papers and boards
1,850,000 TONS
Building and industrial papers and boards
2,800,000 TONS

Grass Roots of the Nation Grow Deep in Its Forests

This page from the Fiftieth Anniversary Book, put out by the International Paper Company to commemorate its golden year, graphically correlates the progress of our country with the growth of the pulp and paper industry (See page 1014).

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1948

TRADE WINDS

MANDO Wins Acclaim of Conservationists for Waste Disposal Improvements

▸▸▸ A UNANIMOUS VOTE of commendation was extended to the Minnesota and Ontario Paper Company (Minneapolis) for its extensive program to eliminate pollution of Rainy River by the Northwestern Association of Conservation Clubs at its annual convention held recently at Thief River Falls, Minnesota.

With two pulp and paper mills situated opposite each other on Rainy River, one at International Falls, Minnesota, and the other at Fort Frances, Ontario, Mando was faced with the natural problem of waste disposal and stream pollution. Consequently, in planning its $12,000,000 modernization program, now nearing completion, the company set aside over $500,000 to install waste recovery and disposal equipment as an essential part of this extensive program of modernization and improvement of existing facilities.

It was the result of the start and the current progress of this installation, to be completed this fall, that these federated conservation organizations passed a resolution praising the company in its efforts to practically eliminate entirely the discharge of bark and wood fiber from the mills into the river.

Prior to the start of this elimination program, tests had shown that approximately 50 per cent of the bark in the form of fine fibers passed through the screening system and into the river. The new system calls for a re-circulation of the water that is used in the wood room and installation of special fine mesh screens to remove these bark fines. This, coupled with the save-all units, installed for the recovery of pulp fibers from the white water coming from the paper machines, will result in the recovery of substantially 100 per cent of all wood fibers. To dispose of the bark and wood fibers resulting from these additions, the company has purchased a screw bark press to reduce the moisture content and will burn this fiber in a special furnace specifically ordered to service Mando's disposal system.

Having undertaken this program of modernization and improvement of existing facilities and the construction and addition of new facilities, now nearing completion, with an authorized expenditure of over $12,000,000, Mando has maintained an envious record of progress and expansion.

A substantial majority of these expenditures has gone into the construction and equipping of additional plant units as a part of a broad program to upgrade Mando products for the manufacture of higher grade papers.

There were numerous major improvements in production and service facilities as well as addition of new equipment during the past year at the various Mando mills. The objective was more production and greater sales than ever before. In addition to the expansion of physical property and equipment, there has been the development of new techniques and streamlined production methods.

Details of this program as it applies to the various mill locations can be summed up as follows:

International Falls Mill

As a vital part of the upgrading of the various paper products, Mando has recently completed a huge water filtra-

Pure water is assured with construction of filtration plant having an immediate capacity of 15,000,000 gph

tion plant with an immediate capacity for 15,000,000 gallons per day, and provision for expansion to 30,000,000 gallons. This unit, utilizing the Permutit Spaulding Precipitation Coagulation System, followed by sand filters will be placed in operation this fall and will provide the necessary quantity of pure water so essential in the production of high quality paper.

Additional steam for Mando's expanding operations became available this spring when a new 150,000-pound steam boiler went into operation at the Falls plant. Teamed with a similar steam generator of 85,000 pounds per hour capacity, installed in 1942, and five Heinie boilers, the new giant is expected to meet the steam requirements of the mill for some time.

With a guaranteed efficiency of over 85 per cent, the new Combustion Engineering Unit will produce 150,000 pounds of steam per hour at a pressure of 450 pounds psi.

Mando officials said the installation was required to meet the present and future requirements growing out of expanding manufacturing facilities. Its output will add to other boiler capacity to supply the two new 7500 kw turbogenerators, purchased to meet the increasing demand for electrical energy.

Each of these two new turbogenerators weighs approximately 81 tons, and occupies a foundation 35 ft. x 25 ft. in area. These two larger units will supplement the output of two 4000-kw generators which have been in operation for a number of years.

The turbines are of the double-extracting, mixed pressure, condensing type to assure the most economical use of steam. They operate at a steam pressure of 450 pounds and at a normal speed of 3600 rpm. With these two units installed, the generating capacity of the turbine room at the Falls plant totals 23,000 kw, the equivalent of more than 30,000 hp.

In order to increase the productive capacity of the plant, four new barking drums, each 12 ft. x 45 ft., have been recently installed replacing units which were 10 ft. x 30 ft. It is estimated that this replacement will increase the barking capacity by 50 per cent.

Wood-handling facilities have also been modernized with the addition of two new diesel locomotive cranes enabling the wood yard to more adequately supply the needs of this increased capacity in wood preparation.

A new seven-ton kraft digester has been installed supplementing the two existing digesters. This new unit means a 25 per cent increase in kraft pulping capacity. It also adds considerable flexibility in maintenance and repair work. The old kraft barking drum is being replaced with a new 12 ft. x 67½ ft. drum to fill the need for more wood, occasioned by the utilization of this new unit.

In line with this program of the upgrading of paper products, Mando is installing groundwood and kraft bleaching facilities and equipment. The kraft bleachery will be a six-stage, hundred-ton system. With the buildings to house these facilities almost complete, and a major portion of the equipment on hand, it is expected that bleaching facilities as well as the new water filtration system will be inaugurated late this fall.

In anticipation of producing bleached paper products, Mando's No. 4 paper machine will undergo considerable modernization. Two new presses, a new fourdrinier, seven new dryers, a new size press, as well as a new stock preparation system will be installed. New Bird Screens will also contribute to this modernization, and the machine will be powered by an electrical drive.

The first supercalendered paper ever produced by the Company was shipped late last fall. This production was considerably stepped up when a 100-in. machine was placed in operation last month. Present production of supercalender paper is being accomplished on two machines, one an 80-in. and the other 100-in., both manufactured by Appleton Machine Company. They are fitted with semi-automatic unwinders and winders which are synchronized to permit roll changes without stopping. Top speed of these machines is 1,850 fpm. One additional supercalender with a 60-in. width has been installed and will be in operation within a month.

Another feature of the modernization is the replacement of the pocket grinders at the Falls mill with five Great Northern grinders, greatly increasing the capacity of the grinder room. These grinders will be driven by five 3,000-hp. generator motors made by Electric Machinery Mfg. Company.

Fort Frances (Ont.) Mill

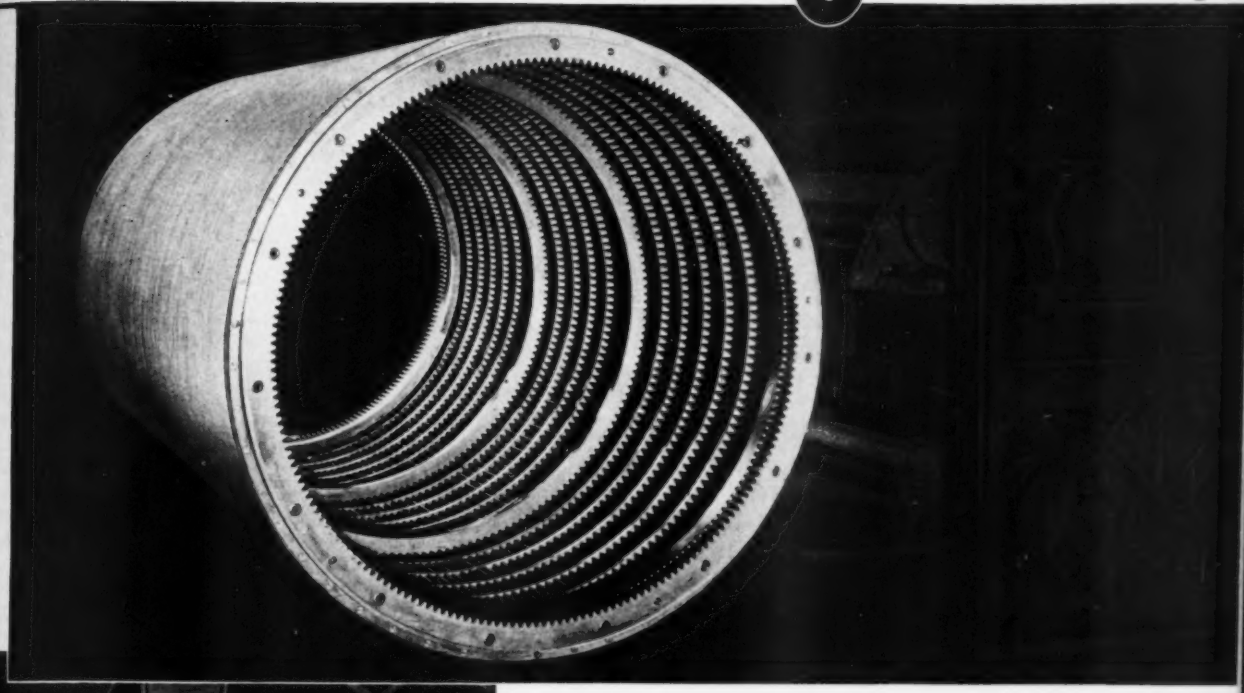
Required extensions to No. 3 groundwood mill were accomplished recently. Construction was undertaken to house eight additional pocket grinders. They were set up in two lines of four each, and provide the number of stones necessary to produce the quality and quantity of high-grade pulp desired.

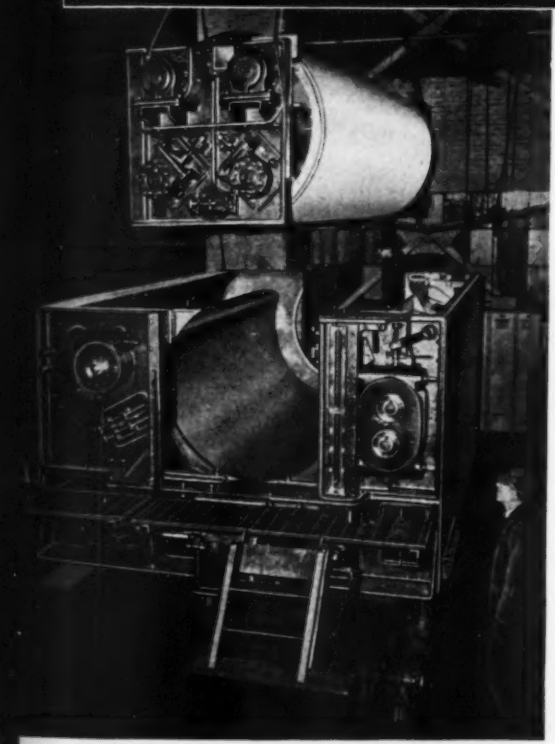
A new boiler unit capable of producing 85,000 pounds of steam per hour, is presently being installed to replace units of smaller capacity, increasing the steam supply necessary to meet the new requirements imposed by the general modernization program. This new unit, which is of the most modern type, is automatically controlled. It is to be stoker fired, is complete with water walls, superheater and forced and induced draft equipment. Over two miles of 3-inch steel tubing comprise the heating surface necessary, some 12,600 lineal feet.

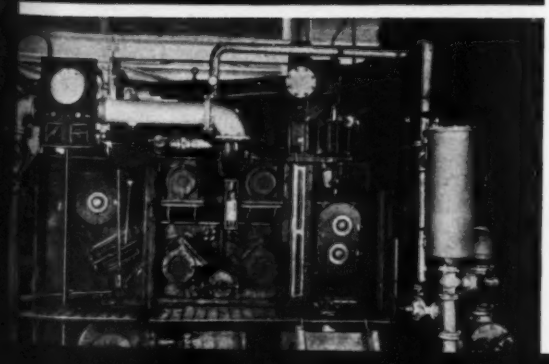
No. 6 paper machine is to be completely modernized, converting it from the manufacture of newsprint to that of higher grade groundwood printing papers. The modernization features include a new slice, improvements to the fourdrinier and the installation of a suction couch. The press section is also being modernized and a smoothing press installed. Six additional paper dryers are being added, and a new Pope type reel and Cameron winder are being installed at the dry end. Another feature of this modernization is the substitution of a new modern electric

Kraft bleachery nearing completion

PAPER · · · America's 6th Industry







Stream-Flow Cylinder Mold for a sheet free of spoke disturbance

You can actually *see* the difference in sheets formed on the Vacuum Stream-Flow Cylinder Mold. Formation is greatly improved due to the elimination of spoke disturbances. As the mold rotates, water is drawn gently inside and there is no disturbance of fibers already formed on surface.

This new development for both single cylinder and multi-cylinder machines—permits use of vacuum to whatever degree the operator desires and thereby:

(1) Lowers consistency by increasing drainage
(2) Reduces slipping, especially at emergence
(3) Reduces amount of slice water and counteracts couch crushing
(4) Keeps felts clean by drawing white water down instead of up through felt

If you are operating cylinder machines and haven't seen the Vacuum Stream-Flow Cylinder Mold, write us without delay. Let us give you the latest report on improved forming quality and rates of production with the Vacuum Cylinder Mold. The results will amaze you. Our bulletin, "The Vacuum Stream-Flow Cylinder Mold," is yours for the asking.

Paper is no better than its formation

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington 99, Delaware, U. S. A.

THE SIGN OF TRADE MARK

drive on this machine for the steam engine drive formerly employed. The complete fluorescent lighting system was also installed to give better lighting to the operators of the paper machines.

Present plans call for the installation this winter of heat recovery units for two of the paper machines at Fort Frances. Under present operating conditions, the excess steam heat coming from the dryer passes directly out of the building, resulting in a distinct loss of heating energy. By the use of these new units, the heat escaping from the paper machine driers will be forced through heat exchanges which function to raise the temperature of incoming cold air some 50 to 60 degrees. These units will not only vastly improve working conditions, but will be of considerable economy in steam produced for mill heating purposes during winter months.

Considerable additions and improvements of the mixing and color rooms were completed this year also, and the groundwood screening and deckering facilities were vastly improved with new tile lining and agitators implaced and improvement of the fine screening system.

To provide further flexibility in logging operations, Mando has acquired a "beaver" type aircraft especially designed and built by DeHavilland for work in the woods. This plane is of the newest design and was produced after an extensive survey of the requirements of the "bush" pilot, the forest ranger and charter operators from coast to coast.

Featuring all metal construction, the cabin of the *Beaver* has a capacity of 144 cu. ft. and a five-place seating arrangement. The seats are easily removable, permitting the installation of a stretcher in a matter of moments, should the need arise.

Fitted with either skis or floats, it can be utilized in any type of weather.

Primarily used by the logging division, the *Beaver* will replace the Republic *Sea Bee*, which has been in service since July, 1947. Utilizing an airplane has proven to be of inestimable value to the company in keeping in close contact with logging operations conducted in remote areas. Through their use, it is possible to make frequent checks on the progress. If necessary, the logging superintendent can cover in a single day what had previously taken weeks.

Equipped with an FM radio unit, the new *Beaver* will become an integral part of Mando's radio communications network operating to co-ordinate all logging activities.

Kenora

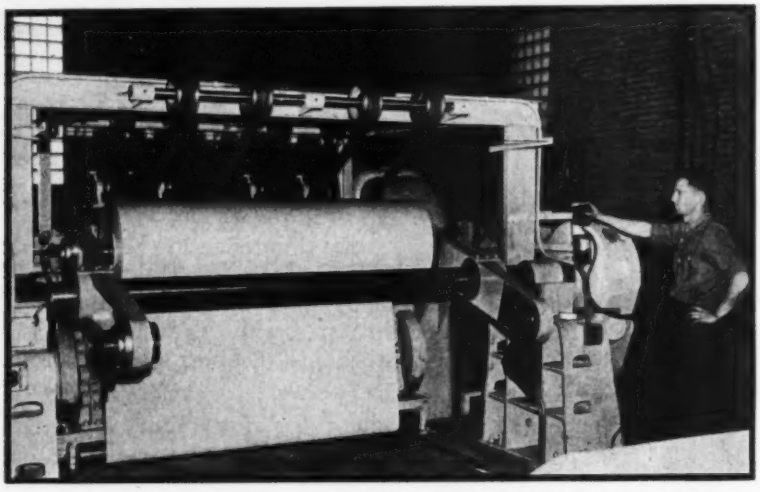
Additional wood preparation facilities were installed at the Kenora mill with the addition of a Circo barking drum and a new sorting table which materially increased the barking capacity of the wood room.

Calender stack drives for the two paper machines were both replaced, increasing the efficiency and aiding proper operating synchronization. New Briner economizer units were installed on No. 8 machine also, and the first press was replaced and modernized. On No. 9 machine the single vacuum box was replaced with a two-compartment box, and provisions was made for additional pumps.

The centralization of production control activities in the Kenora mill was completed early this spring with the arrival of long-waited laboratory furniture, consisting of steel work tables with acidproof tops. The installation of this equipment was the final step in the construction and equipping of a fine new laboratory at the mill.

The laboratory, built in the northwest corner of the mill, was completed last fall. Final equipping of the building was held up due to difficulty in obtaining the equipment from the manufacturer. This addition to the mill is built of brick and tile, and the inside walls are of glazed tile presenting a smooth, bright surface. Windows are large and composed of glass brick, providing a large amount of natural light. Heating of this building embodies radiant heating principles. Hot water piping, built into the floor, turns it into a heating unit. This method of heating is reported to have been proved very successful during the past winter, which had been particularly severe in this part of the country. The laboratory itself consists of three rooms; a main testing laboratory, a groundwood testing laboratory, and an office.

As a part of the present program of modernization, with the aim of making Mando products the best in the industry, the Kenora laboratory is an integral part of that aim, which will be of benefit not only to Mando itself, but also to all who depend upon it for a livelihood.



Supercalendered paper now produced at Mando's International Falls mill

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AUSTRALIAN PAPER NEWS

Paper Companies Merger

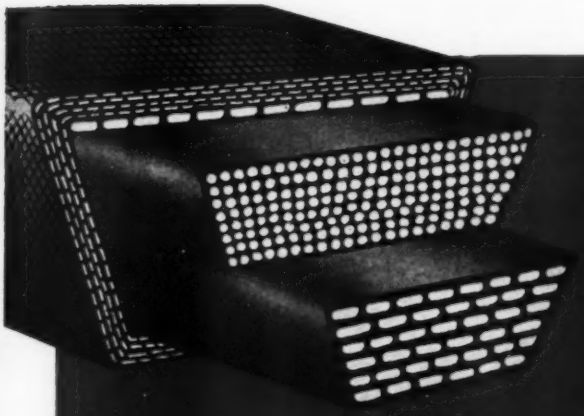
The shareholders have now approved of the recommendation of their directors to merge Australian Paper and Pulp Company Ltd., and Cumberland Paper Board Mills, Ltd.

New Paper Mill for Burnie, Tasmania

Arrangements have been concluded between Associated Pulp and Paper Mills Ltd., and Thomas Owen & Company, Ltd., England, for the establishment of a new paper mill at Burnie, Tasmania. A new company, Thomas Owen & Company (Australia) Ltd., has been formed and will manufacture vegetable parchment, greaseproof, glossiness and other specialty papers. Nominal capital of the company is £3,000,000, and subscribed capital £1,750,000. Ordinary capital of £1,000,000 will be held equally by Thomas Owen & Company, England, and Associated Pulp and Paper Mills Ltd., Australia. There will be £750,000, 4½ per cent, £1 shares, of which £375,000 will be offered to shareholders of Associated Pulp.

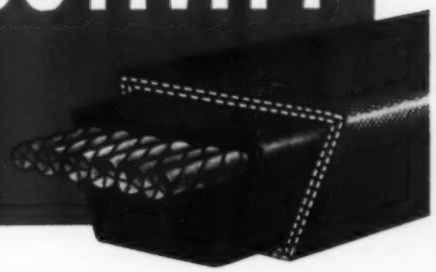
Paper Mill for Ballarat, Victoria

Negotiations for the establishment of a paper mill at Ballarat, previously reported, are now complete. It will produce coated papers. Originally, it was reported that Thomas Owen &



BULL DOG V-BELTS

HELP THE PAPER INDUSTRY BUILD GREATER PRODUCTIVITY



In the present postwar rush for greater production, there's a noticeable trend toward bigger machines with higher operating speeds. Thus more work is turned out, and V-Belts have to carry heavier loads and stand more punishment.

Bull Dog V-Belts are designed to meet these present day conditions. They're entirely new — not a rehash of old construction, but a brand new product developed in BWH laboratories to do your job better, for a longer time, at lower cost. Test runs in leading industries prove that Bull Dog V-Belts more than measure up to laboratory predictions of amazingly increased efficiency.

In the short time they've been on the market, Bull Dog V-Belts have won phenomenal acceptance. Here's why:

EXCLUSIVE BWH Bull Dog Cords have greater tensile strength.

EXCLUSIVE BWH Compounds run cool, don't crack, or deteriorate under severe flexing.

EXCLUSIVE BWH Covers of heavy, bias-cut material resist wear, protect against dirt, grease, moisture.

Specify Bull Dog V-Belts on your next installation. You'll be glad you did, when you see maintenance cost sheets and production records!

OTHER FAMOUS BWH PRODUCTS

Rugged BWH Conveyor Belts of all types are winning new laurels throughout industry for their stamina and efficiency. For details, write your BWH distributor.

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all principal cities

PLANT: CAMBRIDGE, MASS., U. S. A. • P. O. BOX 1071, BOSTON 3, MASS.

Company, England, were the only purchasers of the site where the mill was to be erected. However, it is now known that British Coated Board and Paper Mills Ltd., England, and Associated Pulp and Paper Mills Ltd., Australia, are associated with the Ballarat project.

Big Newsprint Scheme

Eric Kennedy, chief executive officer of Associated Newspapers Ltd., Sydney, has left Australia on an important newsprint mission to Britain. The success of the mission might mean an additional 16,000 tons of newsprint for Australia in 1949. Mr. Kennedy is representing all the metropolitan daily newspapers in Australia.

This newsprint goal consists of two separate schemes, the first for the making of 10,000 tons of newsprint in Britain from Scandinavian pulp and North American sulphite. The British Board of Trade offered to supply sufficient Scandinavian mechanical pulp to manufacture in England 10,000 tons of newsprint, provided Australia was able to obtain sufficient sulphite pulp from America for mixture with the Scandinavian pulp. It is understood that the necessary sulphite pulp can be purchased from Canadian mills to make the scheme a success. However, Australia is not interested in the proposal unless it is certain that it would not in any way interfere with the supply of newsprint to British newspapers.

The second scheme, proposed by the Australian representatives of Bowaters, the British-Newfoundland paper manufacturers, provides for the making of a quantity of newsprint in Britain from imported Newfoundland pulp logs and sulphite pulp. The proposal was for the switching of dollars now spent by Australia in buying Newfoundland newsprint to the purchase of pulp logs and sulphite pulp in Newfoundland, shipment to Britain and manufacture in Bowater Mills into newsprint for Australia. If finality can be reached an additional 6,000 tons of newsprint for 1949 can be expected to result.

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FINANCIAL

▶▶▶ THE BERLIN CRISIS caused two days of sharp recessions in the securities markets in late September. In each case there was a day of falling prices followed by a drop in transactions and a steadying of prices. Paper mill common stocks followed the general trend, but the solid background of the industry was shown by the fact that the changes in the closely held preferred stocks were far less than those in the more speculative issues.

Celotex Corporation — Net income for nine months ended July 31 was $5,020,657 as against $4,507,963 for the same period in the preceding fiscal year.

Crown Zellerbach Corporation—Net profit for three months ended July 31 was $4,288,688 as compared with $4,824,205 for the comparable period in the previous fiscal year.

Crystal Tissue Company—Net profit for the first six months of 1948 was $91,745 as compared with $110,528 for the same period a year ago.

P. H. Glatfelter Company — Net profit for the fiscal year ended June 30 was $683,805.

Hollingsworth & Whitney Company —Net profit for twenty-six weeks ended June 27 was $1,952,456 as compared with $1,107,301 in the comparable period of the previous fiscal year.

Nekoosa-Edwards Paper Company, Inc.—Net earnings for the first six months of 1948 were $1,572,000, an increase of $123,000 over the same period in 1947.

Paraffine Companies, Inc.—Net income for year ended June 30 was $3,636,243 as against $3,241,879 a year ago.

Soundview Pulp Company—Net income for eight months ended August 31 was $3,807,232 as compared with $4,099,783 for the same period in 1947.

United Board & Carton Corporation —Net income for the year ended May 31 was $1,222,735.

United Wallpaper, Inc.—For the fiscal year ended June 30 the company sustained a loss of $52,000 compared with a profit of $1,842,345 the preceding year.

Paper Mill Corporate Changes

Eastern Corporation — Large scale expenditures on new production facilities have so enhanced the output and earnings of the company that a group of bankers is offering for sale 25,000 shares of the company's stock, previously held by a domestic investor. The sale is of stock already issued and not of a newly issued block of stock.

Jessup & Moore Paper Company— The Kenmore mill at Providence, Maryland, has been placed on the auction block for sale October 28 either as a whole or piece-by-piece.

Carthage Paper Makers, Inc.—The capital is being increased from $400,000 to $1,000,000 by the issue of 12,000 shares of $25 per common stock and 7,000 shares of $100 preferred.

Byron Weston Company — Production of high grade papers made by the Hampshire Paper Company has been taken over by the Byron Weston Company under a provision by which Hampshire will continue as a papeterie producer, using the brands of paper now transferred to the Dalton, Massachusetts, company.

New York Stock Exchange—Stocks

	Closing Prices Sept. 27	August 25
A.P.W. Products	5⅜	5¼
Celotex	26	29
Same Preferred	18½	18¾
Certain-teed Products	14	16¼
Champion P. & F. Co.	22	24½
Same Preferred	•97-99	•96½-98
Chesapeake Corp.	•28⅝-29½	•27¼-28¼
Container Corp.	34½	36⅝
Same Preferred	92	•92-95½
Continental Diamond	10	11
Crown Zellerbach	27⅛	28⅝
Same Preferred	97	100½
Same $4 Preferred	100	106⅛
Dixie Vortex	28½	•31-33½
Same "A"	52½	•52½-53¼
Robert Gair	6⅝	8
Same Preferred	•17½-18	•18½-18¾
International Paper	55½	59⅛
Same Preferred	•94½-96½	95
Kimberly-Clark	20⅛	21⅞
Same Preferred	96½	•96½-98
McAndrews & Forbes	37½	•36⅝-37
Marathon	21⅞	22⅝
Masonite	55¼	61
Mead Corp.	18⅛	18¼
Same Preferred	91½	91
Same Sec. Pref.	•36-38½	36¼
National Container	9¾	10¾
Paraffine Cos.	21½	•23½-25¼
Same Preferred	•102-104	•103¾-104½
Rayonier	30	32⅝
Same Preferred	•32-32½	32½
Scott Paper	44½	46
Same Preferred	•87¾-89½	•92¼-93½
St. Regis	10¼	11⅝
Same Preferred	87⅞	•89-91
Sutherland Paper	40	•41-42½
Union Bag & Paper	30½	34⅜
United Board & Carton	10	•11-11¼
United Wall Paper	3⅜	4
Same Preferred	•23½-24¾	24
U.S. Gypsum	96	107
Same Preferred	•167-171	•170-172½
West Va. P & P	46¼	•45½-46½
Same Preferred	•103½-105¾	•105-106

New York Stock Exchange—Bonds

Celotex 3½%	.....	.....
Champ. P&F Co. 3%	.....	.....
Certain-teed 5½%	.....	.....

New York Curb Exchange—Stocks

Am. Writing	5⅜	.....
Great Northern	38⅞	37¼
Taggart	.....	.....

•Closing Bid and Asked Prices.

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IMPORT NOTES

Nearly a year ago, Mexico unilaterally revoked many of the concessions granted in a trade agreement with the United States, effective in 1943. The State Department has been negotiating with Mexico for a revision of the present Mexican program, which affects a considerable number of grades of paper. This is no indication, according to Warren B. Bullock, Manager of the Import Committee of the American Paper Industry, that Mexico will restore the concessions it made in this agreement, and the United States, as far as is known, is making no suggestions that this country might retaliate by withdrawing its own concessions under that agreement. On the contrary, Mexico has devalued the peso from 4.85 to the dollar to approximately 6.70, adding still further burdens to American exporters, and advantages to Mexican shippers.

An imported paper from Canada, claimed to be dutiable as printing paper, is believed to be wrapping paper dutiable at a higher rate.

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SERVICE
CHEMICALS

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Canadian bristol board for use in business machines is claimed to be dutiable as paperboard, not at the higher rate for bristol.

Bible paper, imported at San Francisco, claimed by importer to be dutiable as printing paper, has been classified for duty at the higher rate for bible paper weighing between 10 and 20 pounds per ream.

Box cover paper, claimed by importer to be dutiable as printed material, has been classified for duty at the much higher rate for fancy coated paper.

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I. P. COMPANY ENTERTAINS AT PREVIEW OF SPECIAL 50TH ANNIVERSARY BOOK

A preview of its 50th Anniversary book was held September 16 at the galleries of Associated American Artists, Inc., New York City, by the International Paper Company.

Special invitations to the preview were sent by the company to more than 700 typographers, designers, art directors, artists, paper and printing technicians, and key people in the advertising, public relations, and graphic arts fields.

The book, which is dedicated to the company's 35,000 employees, is considered one of the most unusual productions ever published by a U.S. industrial firm. It is quite unique in that it uses all three basic printing processes —letterpress, gravure, and offset. Illustrations in color are by five outstanding artists, and photographs by a number of well-known photographers. It is being printed in an English edition of 105,000 copies and a French edition of 10,000 copies.

Not only is this unusual book a fitting portrait of the growth and achievements of the International Paper Company during its fifty years, but it may be considered a glowing epic of the great industry of which this company is a part.

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BRITISH PAPER NOTES
August, 1948

The gradual stepping up in the imports of papermaking materials to Great Britain was continued during July with the result that the total for the first seven months of this year are far in excess of 1947. The aggregate to the end of July was 892,426 tons representing nearly 226,000 tons more than during January-July 1947 and 75 per cent of the pre-war rate of importation. While imports of all grades of wood pulp are higher than last year, esparto grass imports are at 120 per cent of 1938 and rags are 50 per cent up on last year. Canadian materials have

moved up from 37,644 tons for seven months of 1938 to 91,219 tons for the same period of this year and those from Newfoundland from 877 to 28,085 tons. Incidentally, among the imports of papers and boards there is an item of 5,042 tons from the Soviet Union against Nil last year and imports from the U.S.A. now total 18,996 tons against 6,067 tons for January-July 1947. Cost of these papermaking materials have reached nearly £30 million against just under £16¼ million last year and a little more than £10¼ million in prewar. American sales of paper to Great Britain this year are nearly £800,000, twice as much as last year against just over £300,000 in 1938.

That the general picture of the British Paper Trade is gradually changing is disclosed by two items of news which have recently been published. Permitted production of newsprint has just been increased from 35 to 40 per cent of prewar and now stands at the highest rate since the end of the war. The extra 5 per cent represents an additional production of just under 1,000 tons per week and as there is no suggestion that newspaper sizes are to be increased, this higher production will provide a little help towards rebuilding stocks which has been a source of anxiety to the Newsprint Supply Company over the past few months. Concurrently the arrangement, whereby outstanding export tonnage available and licenses on hand were to have been reviewed at the middle of the present license period (beginning of September) has already been waived, in respect to coated papers, signifying that there is sufficient freedom among the coated qualities to allow the makers to seek whatever outlet, by way of exports, they can.

This is certainly a slight loosening of control and it will be interesting to see whether further steps in this direction will be taken before the end of the present license period. In any case it is already being speculated that the next license period (November to February) will witness an appreciable improvement in quotas. Whether this will operate remains to be seen.

While the extra materials noted above are being received from abroad it is inspiring to read that an extra 60,000 tons of wastepaper has been salvaged during the first six months of this year, sufficient to put an end to the importation of wastepaper. Doubtless this extra wastepaper has influenced the additional 5 per cent newsprint production and as coated paper exports have now reached 175 per cent of prewar it is understandable that these are to be encouraged particularly, as the paper trade as a whole has not been able to reach its export target and has still much further to go to equal the end of the year target.

Against the need for greater exports comes the news from the Board of Trade that there is to be an expansion of exports from Sweden to Great Britain and that among the items included in this expansion are newsprint and other papers. In 1938 Sweden exported 166,755 tons of paper and board to Great Britain and during the first seven months of this year their exports have totalled 74,602 tons, approximately 45 per cent of the prewar rate.

Washington News

NATIONAL PLANNING ASS'N REPORTS ON PACIFIC COAST AREA OF PAPER INDUSTRY

Fourteen years of industrial peace in the Pacific Coast area of the paper industry have been cited for commendation by the National Planning Association in a report submitted by a committee of experts. The study covers a three-state bargaining unit of two American Federation of Labor unions with eighteen companies, with particular attention to the Crown-Zellerbach Corporation as the largest of the participating manufacturers. The close participation with its employees by management, in the case of Crown-Zellerbach, is given particular attention with the resultant mutual respect developed between the two groups. The study warns that the existence of peace is not assured for the future with a major source of insecurity a potential disruption by rival unionism.

▶▶▶ THE COMPLEX PROBLEM resulting from the recent decisions involving the use of basing points for pricing merchandise is being given careful study by the Capehart Commit-

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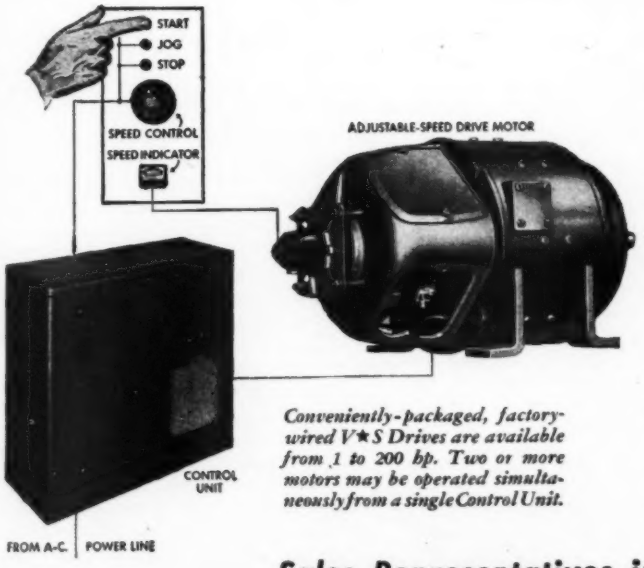

Conveniently-packaged, factory-wired V★S Drives are available from 1 to 200 hp. Two or more motors may be operated simultaneously from a single Control Unit.

Today, thousands and thousands of Reliance V★S Drives, providing *adjustable speeds from A-c. circuits,* are helping to increase production and reduce costs in every industry. These completely packaged, all-electric drives have become so popular since they were first introduced ten years ago that there is now no important industry where they are not being profitably employed. If you do not yet have the proved time-saving and cost-cutting advantages of Reliance V★S Drive in your plant, it will pay you to investigate further. Write for *new* Bulletin 311!

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tee at Washington, a senate committee named to study the effects of these decisions on industry in general. A. Southon, of the Kalamazoo Vegetable Parchment Company, has been named a member of the Committee's Advisory Council and George Olmstead, Jr., has been asked to testify as to the possible impact of a new method of pricing merchandise on the paper industry.

SWEDISH PULP REDUCED

A reduction of the price of Swedish pulp amounting to $10 to $20 per ton, has followed the elimination of the Swedish export tax which was imposed to provide a fund to cushion a depression in the pulp market and to bolster Sweden's dollar position. The tax has resulted in higher prices for Swedish pulp than those offered by domestic and Canadian producers with the result that its purchase was economically impossible.

It is reported that some of the Norwegian pulp producers will meet the new Swedish prices with comparable reductions in their quotations. The price changes affect nearly all grades of chemical pulp.

▶▶▶ A NATIONAL BODY of business men, The National Security Resources Board, is perfecting its organization to facilitate co-operation of business with Government in such an emergency as a future world war. A Forest Products Division is being organized and some outstanding paper mill representative may be named as head of that division.

▼

CHAMPION PAPER & FIBRE PRESENTED WITH "BEST OF INDUSTRY" ANNUAL AWARD

For its current annual stockholder report, the Champion Paper and Fibre Company, Hamilton, Ohio, has been designated to receive the "Best of Industry" award, according to Weston Smith, vice president of *Financial World*. The "Bronze Oscar" for the pulp and paper industry was presented to Reuben B. Robertson, president of Champion, at the annual award banquet held at the Hotel Pennsylvania on October 21.

The award is made each year by *Financial World* to the company whose annual report is judged best in the industry which it represents. An independent board with wide experience in financial reporting, corporate publication relations and the graphic arts did the judging. This year's board included Dr. Lewis Haney, professor of economics, New York University; Dr. Glenn Griswold, editor and publisher of *Public Relations News;* Elmer Watzer, financial editor, United Press Associations; Sylvia F. Porter, financial editor, *New York Post;* and Lester Tichy, industrial designer and architect.

The report, directed to Champion stockholders, reflected operating results for the fiscal year ended April 30, 1948. It showed sales of $86,735,837, up from $67,611,197 the previous year. In addition to financial information, running text-and-photo commentary portrayed manufacturing processes of the company.

The prize-winning Champion Report was prepared under the direction of Dwight J. Thomson, vice president in charge of industrial and public relations, and was produced by Frank Gerhart, Champion's advertising manager.

▼

KIEFFER PAPER MILLS WIPED OUT BY FIRE— NO REBUILDING PLANS

A devastating fire wiped out most of the Kieffer Paper Mills at Brownstown, Indiana, September 26. Damage to plant and equipment was estimated between $1,000,000 and $1,500,000.

The estimate was announced by John E. Kieffer, company treasurer, who stated the loss was only partially covered by insurance. Included in this, was a one-story brick and steel mill and a warehouse, occupying about two acres of ground space, while loss to machinery, tools and materials was exceptionally heavy.

The fire was discovered in one of the processing rooms toward the front of the mill building just as the night shift was getting ready to go off duty. A falling electric wire landing on paper stock is believed to have started the fire.

The company has a payroll of 75 persons with an annual expenditure of $200,000. Val J. Goessling, St. Louis, is president, and Miss Edna Robertson of Brownstown is general manager. No plans have been announced for rebuilding at this time.

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PLANS ARE ABANDONED FOR NEWSPRINT MILL IN WASH.

Abandonment of plans to build a newsprint mill at Longview, Washington, has been announced by a syndicate composed principally of the Southern California Associated Newspapers, last month.

The syndicate has spent $600,000 on the project before halting work early this summer. The plant was to have been operated by the Pacific Paperboard Company, which was to produce 40,000 tons of newsprint a year and acquire ownership of the plant after 10 years. E. E. Flood, Paperboard company president, indicates he is considering whether other financing can be arranged for the project.

▼

PLAN UNDER WAY FOR PULP MILL IN CANTON, CHINA— U. S. CAPITAL INTERESTED*

Plans have been made to establish a modern pulp mill at Mamoi, about nine miles from Foochow (Province of Fukien), China. Negotiations were under way in March for the purchase of 1,000 acres of land for the site of the proposed plant. The project will be financed by both Chinese and United States interests and is expected to cost about $20,000,000, U. S. currency. The building of a pulp mill at Foochow, formerly under consideration by Japan, was abandoned because of the Sino-Japanese hostilities in 1937.

The recovery of the $30,000,000 paper mill, formerly located at Canton, is anticipated within the next six months. The mill, which has a production capacity of 50 tons daily, will be erected again in the Canton area; the present location is Hokkaido, Japan.

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▶▶▶ BECAUSE IT IS OBSOLETE, the Provincial Paper, Ltd., announces that it will close its 15-ton mill at Georgetown, near Toronto, this fall. It adds that modernization of its three other mills at Port Arthur, Thorold, and Mille Roches, near Cornwall, will take care of the loss of output. The mills, which makes a raw stock for fine paper, dates back to the middle of the last century.

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CHILEAN GOVT. ASKS LOAN TO FINANCE BUILDING OF $4,000,000 SULPHATE MILL*

The erection of a wood-pulp mill at General Cruz, about 30 miles south of Chillan, Chile, by 1952, has been proposed. The output of the mill, which will be about 40,000 metric tons annually, of which 30,000 tons will be sulphate pulp, will be used by the country's largest paper manufacturer. The company expects to control enough land in the near future to supply about 60 per cent of the annual pulpwood requirements.

The Chilean Government recently applied for a loan from the International Bank for Reconstruction and Development to aid in financing the project, which calls for a total investment of $4,000,000.

(*) Published in *Foreign Commerce Weekly*

VESSEL DIVISION

NEWS

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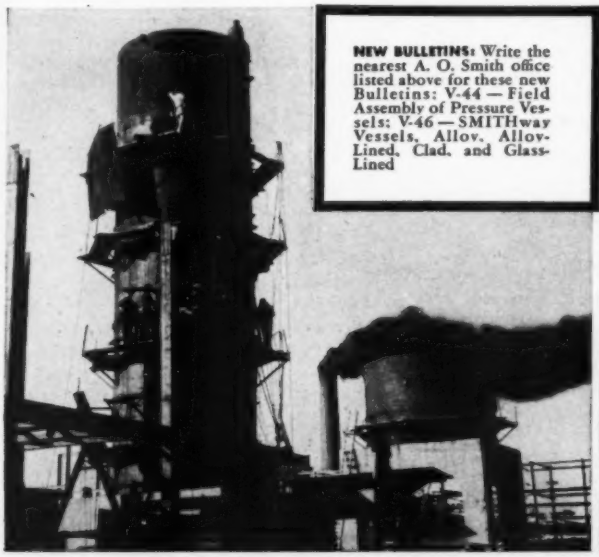
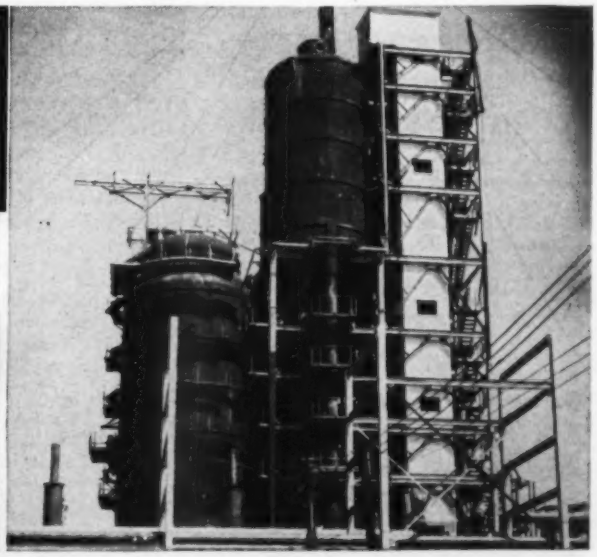
TEAMWORK GETS RESULTS. This is the team that field-erected the SMITHway Vessels for the refinery shown below.

Harold Pollei (right), supervisor of A. O. Smith Field Service, is backed up by the vast metallurgical, welding, spectographic, and electrical laboratory facilities of A. O. Smith in solving the daily technical problems with Harry Drummond (left), job superintendent on the field work, and two of his foremen.

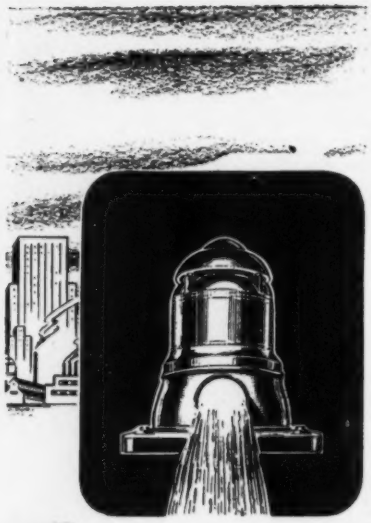


NEW BULLETINS: Write the nearest A. O. Smith office listed above for these new Bulletins: V-44 — Field Assembly of Pressure Vessels; V-46 — SMITHway Vessels, Allov, Allov-Lined, Clad, and Glass-Lined



CRUDE OIL UNIT. Left, fractionating column, 14 ft. dia. x 89 ft. 8 in. high, weight 165,000 lb., SMITHlined with monel and type 405 stainless steel. Right, vacuum column, 22 ft. dia. x 51 ft. high, weighing 183,000 lb., SMITHlined with type 405 stainless steel.

FLUID CATALYTIC CRACKING UNIT NEARING COMPLETION. At left is the regenerator, 20 ft. dia. x 79 ft. 8 in. high, weighing 334,000 lb. Right, the reactor, 22 ft. 6 in. dia. x 62 ft. high, weight 266,000 lb., is carbon moly SMITHlined with type 405 stainless steel.



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For nearly seventy years Layne Well Water Systems have been recognized as the world's finest, but now and then we like to remind our friends—and ourselves of the reasons why. From pump head to screen point, every single part of a Layne Well Water System is definitely "Better Built for Better Service." Maintaining that highly essential standard, especially during material shortages, has not always been an easy task, but not once has a compromise been made.

Today, Layne Well Water Systems are actually finer in quality of materials, higher in efficiency and better in construction than ever before. This is particularly pleasing to the entire Layne organization, for it affords genuine satisfaction to have users well pleased.

The advantages of owning a well water system in which full confidence may be placed is too obvious for comment. An unfailing and adequate supply of water is of utmost importance. It is a matter of record that the fine quality of Layne Well Water Systems is remembered and appreciated long after the purchase price has been forgotten.

For further information, catalogs, bulletins, etc., address Layne & Bowler, Inc., General Offices, Memphis 8, Tenn.

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LACK OF WATER CLOSES GROVETON PAPER COMPANY

A lack of water for processing has indefinitely closed down the Groveton Paper Company, Groveton, New Hampshire, employing 800 people. Officials of the company said the Ammonoosuc River has dried up leaving the factory without water to process the bond, envelope and mimeograph paper it manufactures.

The company, which is the town's major industry, normally operates in three shifts six days a week. The plant will be inoperative until a heavy rain fills the river.

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PAPER INDUSTRY APPROVES HOME STUDY FOR EMPLOYEES

People who work for the far-flung pulp and paper industry in the United States and Canada will not have to leave home to study industry-approved job training courses. This was made known recently when the Joint Textbook Committee of the Pulp and Paper Industry of the two countries announced that it has approved the Pulp and Paper training courses offered by International Correspondence Schools, of this city. J. N. Stephenson, noted textbook authority in the paper field, has been retained by I.C.S. as its expert consultant in teaching these courses to employees of the paper industry.

All of the eight courses included in the official approval have been tested for many years by people in the paper industry who have studied with I.C.S. Many of these students have climbed to high places in the industry, and their success, plus the half century record of these Schools—now the world's largest educational institution—are reflected in the Textbook Committee's approval. The courses are Pulp Making; Paper Making; Pulp and Paper Making; Paper Machine Operation; Paper Finishing; Short Pulp Making; Beater Room Operation and Pulp and Paper Testing. They range from 14 to 18 lessons, and are being used by many pulp and paper companies at the present time to train groups of employees.

BRIEFS

▶▶▶ AN EMPLOYEE PLAN for retirement has been announced by The Longview Fibre Company, Longview, Washington. Complete benefits under the plan will benefit about 2,000 employees of the company at Longview as well as in the company's box plants in Springfield, Massachusetts, and Los Angeles.

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▶▶▶ A BOILER ROOM explosion at the southern kraft division of the International Paper Company, Camden, Arkansas, recently caused the injury of three men, one of them seriously. Extensive damage to the equipment was reported.

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▶▶▶ A NEW DIGESTER and supporting equipment has been installed in the Marinette, Wisconsin, sulphite pulp mill of the Scott Paper Company. An appropriation of $300,000 has been made for this unit, which will replace two smaller units and will increase the capacity of the mill from thirty-two to forty tons per day.

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▶▶▶ TO AID FARMERS and landowners, the Lions Club in Augusta, Georgia, has formulated plans to plant more than 500,000 pine seedlings at a cost of less than one cent per tree. The Lions will furnish a tree planter, an operator for the planter and the trees all at a low cost. In addition, the Club will promote the protection of woodlands from fire and other hazards. It will also work toward securing legislation to prohibit the setting of miscellaneous fires, for adequate enforcement of existing laws, and the securing of a fire protection unit for Richmond County.

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▶▶▶ CAPITALIZATION from $400,000 to $1,000,000 has been reported by Charles S. Hirschey, president of the Carthage Paper Makers, Inc., Carthage, New York. The company was incorporated on October 24, 1932, at a capitaliation of $400,000 consisting of 2,000 shares of $25 common stock and 3,500 shares of $100 preferred.

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▶▶▶ A BRANCH SALES office in San Francisco has been opened by the International Paper Company's Bagpak Division. W. A. Scholl will be the district sales manager. The Bagpak Division makes heavy-duty multi-wall kraft paper and shipping sacks used by the cement, fertilizer, lime and limestone, food products, chemical, and other industries.

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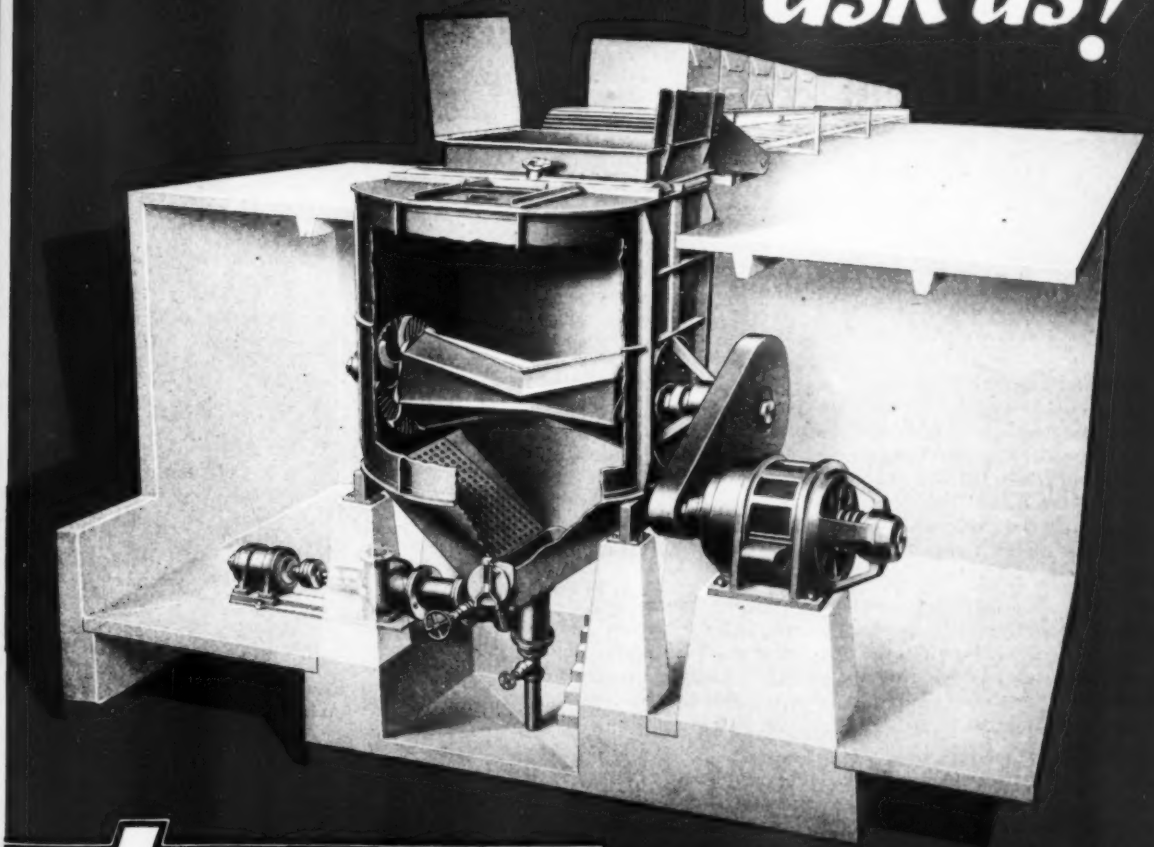
▶▶▶ FOREST NURSERIES of the states will produce 368,306,000 tree seedlings next year, according to a recent survey just completed by the American Forest Products Industries, Inc., Washington, D. C. This will more than double the production of last year which was 156,976,551 seedlings.

WET STRENGTH

A CINCH with the PULP-MASTER ★

Ask us!



Jones

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Builders of Quality Machinery for Paper Mills

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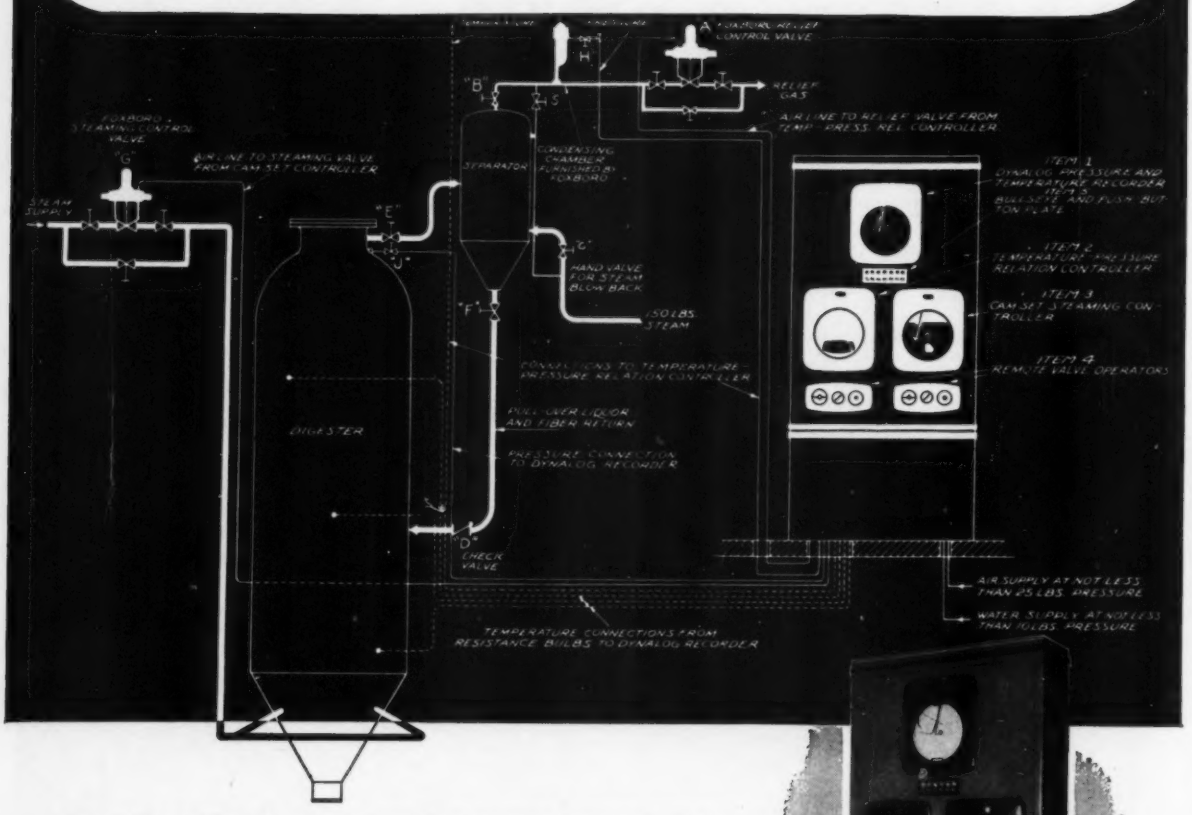
BOOST FIBER YIELD...LOWER STEAM CONSUMPTION

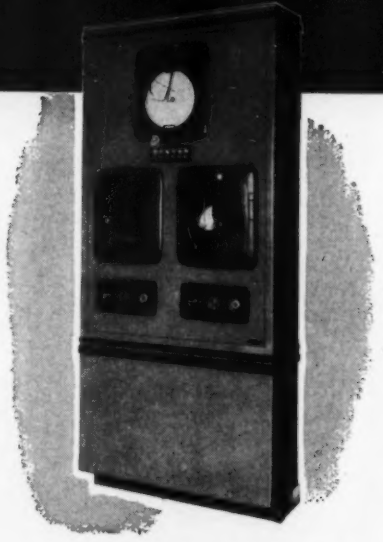
with this Alkaline Digester Control System


A
CONTROL RELIEF VALVE
RELIEF GAS
AIR LINE TO RELIEF VALVE FROM TEMP. PRESS. REL. CONTROLLER
FOXBORO STEAMING CONTROL VALVE
AIR LINE TO STEAMING VALVE FROM CAM SET CONTROLLER
STEAM SUPPLY
SEPARATOR
CONDENSING CHAMBER FURNISHED BY FOXBORO
HAND VALVE FOR STEAM BLOW BACK
150 LBS. STEAM
DIGESTER
CONNECTIONS TO TEMPERATURE PRESSURE RELATION CONTROLLER
PULP, LIQUOR AND FIBER RETURN
PRESSURE CONNECTION TO DYNALOG RECORDER
CHECK VALVE
ITEM 1
DYNALOG PRESSURE AND TEMPERATURE RECORDER WITH 3 BULB SETS AND PUSH BUTTON PLATE
ITEM 2
TEMPERATURE PRESSURE RELATION CONTROLLER
ITEM 3
CAM SET STEAMING CONTROLLER
ITEM 4
REMOTE VALVE OPERATORS
AIR SUPPLY AT NOT LESS THAN 25 LBS. PRESSURE
WATER SUPPLY AT NOT LESS THAN 10 LBS. PRESSURE
TEMPERATURE CONNECTIONS FROM RESISTANCE BULBS TO DYNALOG RECORDER

THE PRE-ENGINEERED Digester Control Unit illustrated contains all the essential instruments for automatically maintaining closer control of cooking time, pressure, temperature and relief . . . a Foxboro Dynalog (Electronic) 3-point Temperature Recorder (with pressure pen), a Cooking Schedule Controller with adjustable cam-set control point and a Digester Relief Controller. The Dynalog Recorder comes with an automatic switching unit which gives temperature readings at three different points in digester or, if preferred, two points in digester and one in circulation line.

This cabinet type of control offers complete centralization and operating convenience. It protects instruments from dust and damage. Furthermore, it provides the benefits of experienced factory methods and materials in the wiring and piping of instruments into a properly integrated assembly. This also permits substantial savings in installation time and cost.

Here's the modern way to improve pulp quality and uniformity . . . to reduce steam, chemical, and labor requirements. Talk over your set-up with a Foxboro engineer. Get facts on installations at other mills. Similar units are available for sulphite processes. Write ***The Foxboro Company, 158 Neponset Ave., Foxboro, Mass., U.S.A.***



FOXBORO Automatic Digester Control Unit with controlled rate of temperature rise. Dynalog Temperature Recorder at top. Beneath are Foxboro Digester Relief Controller and Foxboro Cooking Schedule Controller with cam-set control point.

FOXBORO
Reg. U. S. Pat. Off.

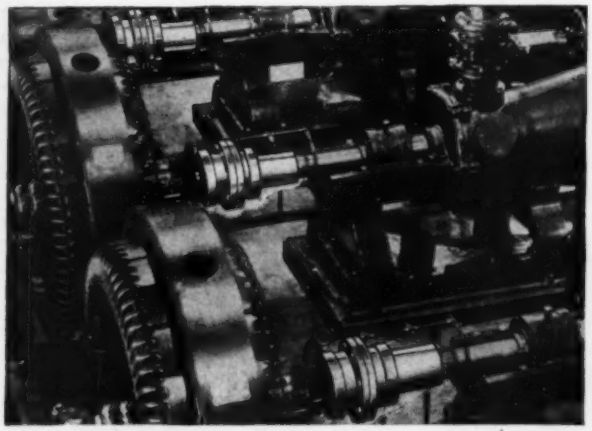
AUTOMATIC DIGESTER CONTROL

How to Get

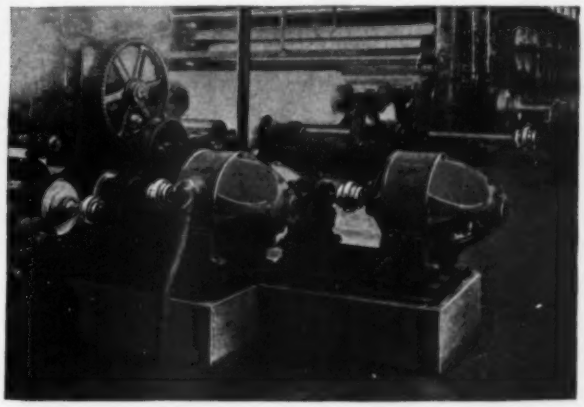
Uninterrupted Power Transmission for All Paper Mill Drives!

SPECIFYING Fast's self-aligning Couplings is the answer! No matter what your coupling problem, there's a Fast's made to solve it . . . and give you longer machine life, lower upkeep costs and minimum shut-down losses. For absolute dependability, these *original* gear-type couplings are built with many important features . . . such as an *exclusive* "rocking bearing."

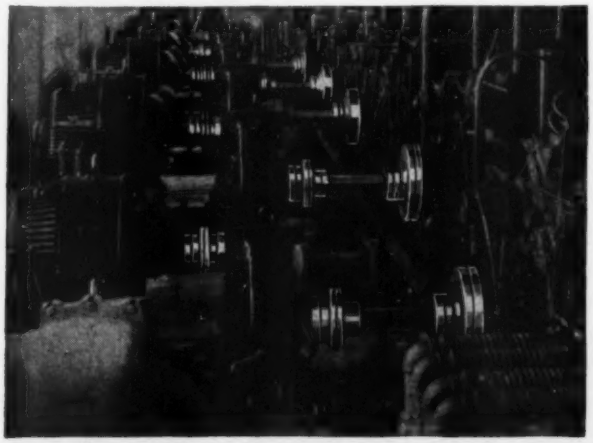
This bearing is *exclusive* in providing a positive metal-to-metal seal against wear-producing moisture, dust and grit. The bearing is also exclusive in its correctly engineered position which allows *freedom of movement* to compensate for misalignment because its *spherical* base has *the same axis* as the hub spline faces. And as a plus, Fast's Couplings give you the benefits of years of top engineering experience, Koppers' high standard of workmanship and unexcelled coupling service which assures spare parts no matter how old your couplings may be. For full information, mail the coupon below to: Koppers Co., Inc., Fast's Coupling Dept. 230 Scott St., Baltimore 3, Md.



FOR JORDAN ADJUSTMENTS—Fast's Jordan-Type Couplings reduce wear on bearings, prolong life of motor and Jordan. Because the Fast's splines are meshed in oil, plug adjustment is smooth and certain. No worn spots can develop. The customary "hard spot" is eliminated. Due to smooth torque and elimination of coupling vibration, Jordan lining life is increased and the product discharged from the Jordan is uniform.



FOR STANDARD APPLICATIONS—Fast's Standard Couplings are designed for use on all ordinary installations. They are made in shaft sizes from 1½" to 5".



FOR REMOTE DRIVES—Fast's Floating Shaft Couplings enable drives to be set back from paper machines without the use of supporting bearings. This eliminates one piece of equipment—does away with the necessity of keeping three or more bearings in line—saves installation cost and eliminates upkeep, attention and replacement of bearings.

K KOPPERS

FAST'S *self-aligning* COUPLINGS

SEND FOR FREE CATALOG!

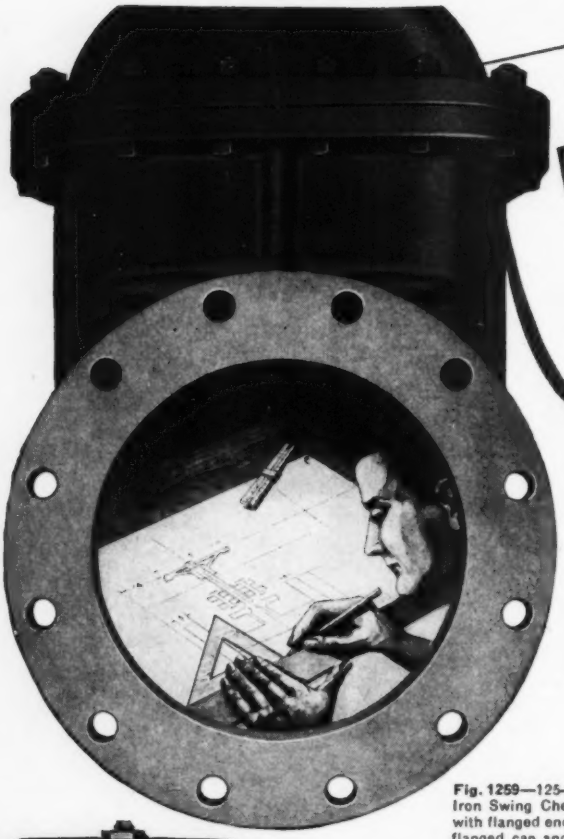
Gentlemen: Please send me your illustrated, informative catalog, giving full information on the many types of Fast's Couplings.

Name.....

Company.....

Street.....

City.....Zone.....State.....



There's Precision Engineering in every POWELL VALVE

Powell makes valves by the thousands. We have to in order to satisfy the nation-wide demand.

But don't be misled! We know that quality often suffers through so-called "mass production" methods. So every Powell Valve from a standard small bronze globe to the most special design for corrosion resistance is given the most meticulous, individual attention. That's why Powell Valves have such an outstanding reputation for long life and dependable performance in every branch of industry. It pays to install Powell Valves.

Fig. 1259—125-pound All Iron Swing Check Valve with flanged ends, bolted flanged cap and regrindable, renewable iron disc.

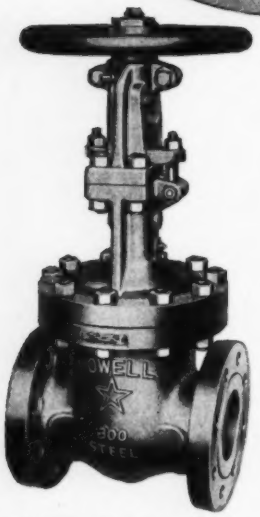


Fig. 3003— Class 300-pound Cast Steel Gate Valve with flanged ends, outside screw rising stem, bolted flanged yoke and tapered solid wedge.

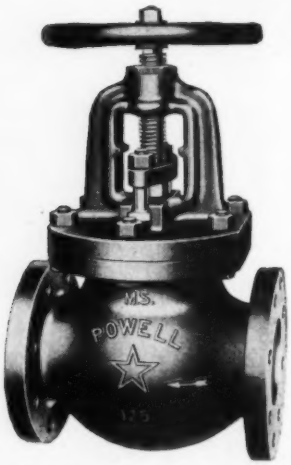


Fig. 457—125-pound All Iron Globe Valve with outside screw rising stem, bolted flanged yoke and regrindable renewable iron seat and disc.

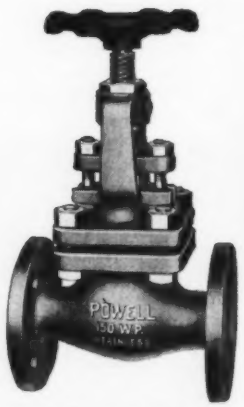


Fig. 1969—150-pound Stainless Steel Gate Valve with flanged ends, outside screw rising stem, bolted flanged yoke-bonnet and tapered solid wedge.

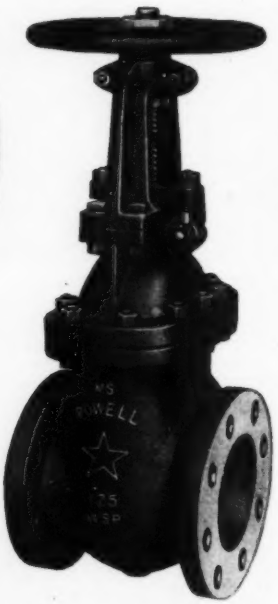


Fig. 1893—Flanged end Gate Valve designed and developed especially for Paper Mill service. Body, bonnet and yoke are cast of 3% Nickel Iron; screwed-in seat rings are 18-8 SMo; solid wedge is made of Ni-resist.

The Wm. Powell Co., Cincinnati 22, Ohio

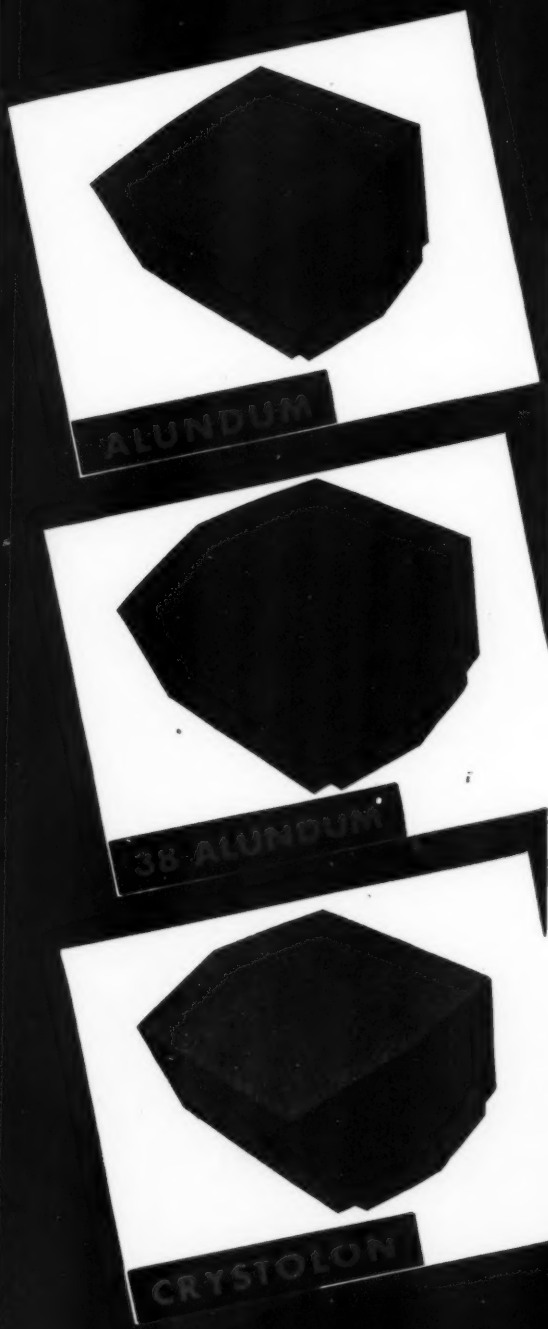
DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

POWELL VALVES

VIRGIN

Norton Has the Right Kind of Abrasive

To Produce Your Kind of Pulp



YES, every Norton Pulpstone is individually engineered to produce just the type of pulp that you require—and this engineering starts with the selection of the right abrasive. Whether it will be ALUNDUM, 38 ALUNDUM, or CRYSTOLON abrasive depends on the kind of wood you are grinding and the type of equipment you are using.

ALUNDUM abrasive is an aluminum oxide product—made by fusing the mineral, bauxite in arc-type electric furnaces at 3700° F. Its hard, tough grains produce a high quality pulp.

38 ALUNDUM abrasive is also an aluminum oxide product but with somewhat different chemical and physical properties which make it especially suitable for producing certain types of pulp.

CRYSTOLON abrasive is a silicon carbide product made by fusing metallurgical coke and silica sand in resistance-type electric furnaces. Its characteristics of hardness and sharpness have made CRYSTOLON stones well known for many years as high producers of quality pulp.

You can be sure that Norton can furnish just the right stone for every grinder in your mill.

NORTON COMPANY, WORCESTER 6, MASS.
NORTON COMPANY OF CANADA, LTD., HAMILTON, ONTARIO

NORTON ABRASIVES

For Highest Shock Absorbing Capacity

and Greatest Load Carrying Ability Use

NORMA-HOFFMANN
ROLLER BEARINGS...

- Performance records in all types of equipment prove that Norma-Hoffmann Precision Roller Bearings have the built-in stamina to stand up under the severest of operating conditions.
- Their short, accurate roller and cylindrical race construction provides maximum load contact area . . . gives these bearings high steady load capacity, large overload capacity, and high resistance to shock and vibration.
- Also available in double and single lipped outer ring types. All are interchangeable with standard single row ball bearings.
- Whether your bearing requirements are for original equipment or replacement, these precision-built Norma-Hoffmann Roller Bearings will give you outstanding performance under the most critical severe conditions of speed, load, shock, and vibration.
- Write for information and engineering assistance.

NORMA-HOFFMANN
***Precision* BEARINGS**
BALL • ROLLER • THRUST

NORMA-HOFFMANN BEARINGS CORPORATION,
STAMFORD, CONNECTICUT
FIELD OFFICES: New York, Chicago, Cleveland, Detroit, Dallas, Pittsburgh, Cincinnati, Los Angeles, San Francisco, Seattle, Phoenix.

SLICE

This new Bagley and Sewall Slice is designed for maximum production and the forming of a uniform sheet. It is rigidly constructed to withstand hydrostatic pressure and eliminate deflection. It is easily adjusted, and the initial setting will automatically align the lip with the apron board. This method of adjusting the flow of stock to the wire assures a level, well laid sheet of paper.

The Bagley and Sewall Slice is non-corrosive and can easily be installed on either new or existing machines.

When considering new paper making machinery, contact our sales engineers . . . they understand production problems.

BAGLEY & SEWALL

DESIGNERS AND BUILDERS OF PAPER MAKING MACHINERY

WATERTOWN, NEW YORK

No, Mr. Superintendent, that Felt is not worn out. You could run it for quite a while before it would become ragged. But the nap is so matted and the mesh is so filled up that it has already lived beyond its "efficient life."

Better replace it with a new Hamilton. Then speed her up. The value of the extra tonnage and the saving on steam at the driers will amount to much more than the price of the new felt. And remember, from the thinnest tissue to the heaviest board there *is* a Hamilton Felt that will last longer and cost less.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •

Fire is Forest Enemy No. 1. In most years more trees are destroyed by fire than are harvested! And the pity of it all is that most fires are caused by human carelessness and ignorance of the far-reaching consequences. Nine out of ten fires can be traced to man. Careless smokers *alone* cause one out of four.

The men and management of Weyerhaeuser Timber Company are keenly alive to the necessity of protecting forest lands from fire. Since 1903 the Weyerhaeuser organization has been participating in cooperative fire protection efforts with other private forest owners and with State and Federal agencies.

Supplementing its fire protection activities, the Weyerhaeuser forestry management program also includes relentless insect and disease control throughout its extensive timber tracts and the company's eight thriving Tree Farms which are producing harvests for the future.

Furthered by this constructive forestry policy, the Pulp Division represents a reliable and continuing source of supply for consumers of bleached chemical woodpulp.

Vanesta

The Starch Stabilizer

R·T·VANDERBILT·CO·N·Y·
VANESTA
AMERICAN PRODUCTS

Stops Gelling

Improves Flow

Gives Uniform Consistency

Sample on request

R. T. VANDERBILT CO., INC.

230 Park Avenue, New York 17, N. Y.

Busy America

▸▸▸ THE SEASONABLE decline in business activity in July was promptly reversed in August as shown by the Federal Reserve Bank Index Number which advanced from 187 in July to 190 in August. For the same month a year ago, the August Index number was 182. For the past three years, the last four months of each have been the big production and consumption period.

So, we started September this year with our industrial activity eight points higher than last year.

This showing gives definite assurance that 1948 will close with another record breaking volume of business at the highest level activity ever known, especially as September business will record a substantial advance over that of a year ago when the final figures are available.

We have heard continuously since V-J Day that this country would witness a recession of business. We heard this same claim made at the beginning of the present year, but there has been no recession in business which the Administration in Washington would consider a recession. What they were evidently playing for was a depression. From their standpoint, we have had neither. But, the following record shows that we have had a fine testing recession:

Federal Reserve Bank Index Figures

Average for the year	
1940	123
1941	156
1942	199
1943	239
1945	235

For October, 1943, the Index Number reached its wartime high of 249. In February, 1946, it struck its postwar low of 153.

The difference between the wartime high and the postwar low is 96 points. That low was 3 points lower than the prewar year figure of 156, for 1941. Since the February, 1946, low of 153, the record is as follows:

February, 1946	153
December, 1946	182
February, 1947	189
August, 1947	182
December, 1947	192
February, 1948	194
July, 1948	187
August, 1948	190

For the ensuing two years and six months, since the postwar low, to September 1st, 1948, the gain in business volume and activity has been consistently higher, showing a net recovery of 37 points and still on the consistent upward trend. . . . And why shouldn't it?

The United States of America is the one sole place in the world to whom all other nations in the world must come to get those necessitous commodities needed for their rehabilitation.

Up to date, this country has been unable to supply the goods needed for our own domestic requirements.

We are looking at the certain demand for more and more goods for Europe and from Asia and the Orient is emerging a demand from a billion people in dire need of everything we produce.

Our judgment is that we have had all the recession the postwar era will see. And so far as fulfilling the future demand that is looming ahead of us, there will be no chance to even partially supply it at any time in the foreseeable future.

We Haven't Lost Our Way

▸▸▸ AT THIS SEASON of every fourth year, the people of the nation are treated to a veritable banquet of campaign oratory. Speakers vie with each other in weaving together phrases of eloquence, many of which find a place in song and slogan.

The public wants promises—most of us like nothing better than definite expectations of more of the good things that bring us into a better way of living.

Speaking before the Sales Executives Club of New York, W. Walter Williams, chairman of the CED, referred to an incident when General Eisenhower, who had escorted two visitors to their car, became lost while trying to return to his office in the Pentagon Building. The truism drawn from the incident was that anyone, even the General, is entitled to get lost in that labyrinth of corridors. But, the speaker went on to say, "the General didn't lose his way to Berlin"! And that's what really counts.

The people will listen to "rhyme or reason," but it's performance they really want.

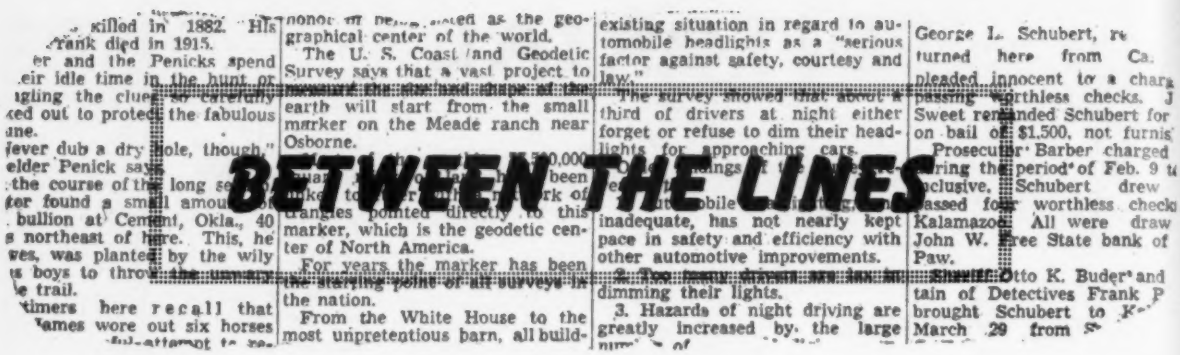
Further in his address, Mr. Williams said:

"We call our economic system the capitalistic system, the free enterprise system and by various other names. I like to call it the Individual Initiative system. By that term we mean exactly what we say and say exactly what we mean. The term "Individual Initiative" system connotes by the very words the dual idea that our economic system rests on the individual and the initiative of that individual. . . .

"Our Individual Initiative system has provided for our people something far beyond mere material benefits—important as they are. It also has provided a greater measure of individual liberties and freedoms than ever have been enjoyed by any other civilization in history. A high standard of living on the one hand and a high degree of freedom and liberty under our political institutions on the other have thus been proven inseparable."

The patriotism that came into being with the first settlers in this country, is still a part of America, and the people belonging to the minority party will support the leaders put into office. Any reasoning person understands that not *all* of the promises made before election time can be kept—circumstances change and events arise which make it better for the national good that some of them would better not be kept.

But leaders come and go, and notwithstanding the general belief that some leave behind evidences of misjudgment, the composite good works of all that have gone before have given us our America—a free nation with that "Individual Initiative system."



Be Polite! Return the Call

▸▸▸ REAL ENJOYMENT of good food is best experienced when one has been starved for a time, and true appreciation of the good things in life comes from having been denied them. "Platitudes"! you say. Yes, of course, but born of sound logic, nevertheless.

When we allowed our gaze to rise above the horizon of sound economics into the blue above, we didn't think much about an invisible ceiling up there. We still don't, and every day that we stay up there and sail around in the vast *expense* of irrationalism means we shall come down faster—and, like those dreams everyone has had at some time or other, we are sure to wake up before we land.

The Committee for Economic Development — well-organized group of national leaders — has published its tenets and purposes under the title "Freedom Has Its Price." In a brief preamble, reference is made to the old saying that "opportunity knocks but once," with the comment that wise men and women do not stay home and wait for that rare visit. They do just the reverse—they go forth and knock on the door of opportunity. It is further stated that—

"Today, we in America have arrived at the doorstep of an era of unparalleled prosperity. We have built a great technological machine of production capable of supplying all of our needs and most of our wants. We have a labor force of sufficient size and skill to keep it going full speed. We have engineering and managerial talent capable of progressively turning out more and better goods and services for more and more people.

"If now, with our foot on the doorstep, we should fail to cross the threshold of prosperity for all of us, it will be because we have refused to pay the price of admission. *That price is the promotion of objective study, informed thinking, and constructive action.*

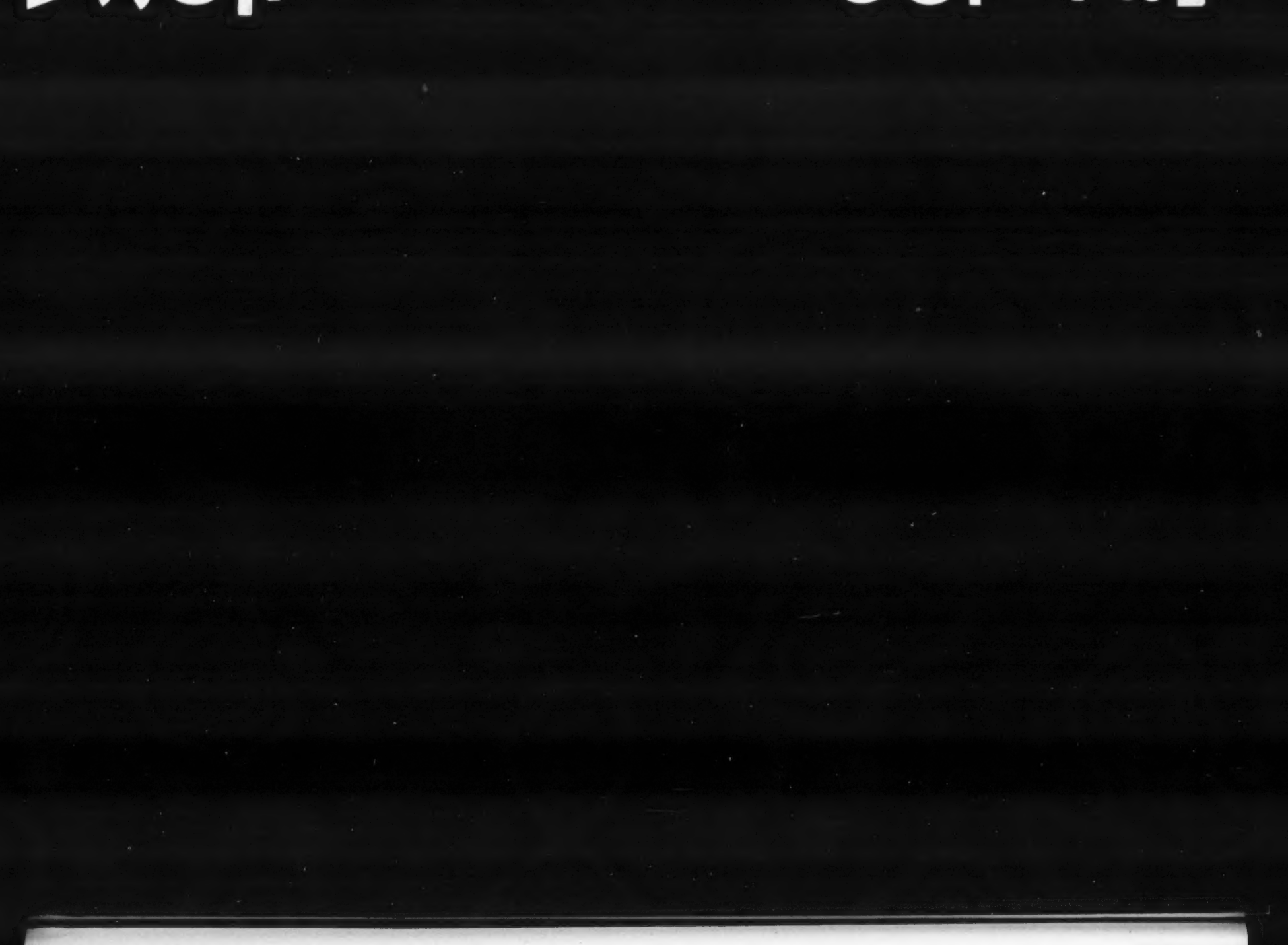
In its Statement of Principles, to which the CED is dedicated, is the following declaration: "We emphatically deny that we are foredoomed in the future to the boom-bust cycle of the past. Any thought that we can have a free economy which will never fluctuate is, of course, nonsense. But we are convinced that this economy of ours can achieve a combination of progressively higher living standards, relative stability, and freedom of choice which will make it by far the most desirable type of economy in the world."

We human beings have had everything made too easy for us. We pass out a lot of loose talk about research and expansion. Great sums are spent to build bigger factories and temples of scientific research. We serve a big meal but we have never learned to wash up the dishes as we go along—we let them accumulate. We relax in a thick shell of civilization while we read of how our ancestors went out after their food, brought it home and cooked it in a kettle over the fire. Our modern kitchens can now be made 100 per cent plastic—except for the plumbing (according to a recent Bakelite display).

Yes, Opportunity has paid us a visit —but we must now return the call; and it won't hurt us to be real neighborly with that benefactor.

Viewing the signs of the times, if we are as smart as we think, we will sign an individual pledge to bridle our "wants" and harness that powerful steed to a very dependable animal which we ruefully term "economy." Quite a team they make if hitched up just right.

—By Bessemer

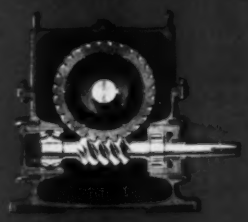


Your kind of...

SPEED REDUCERS

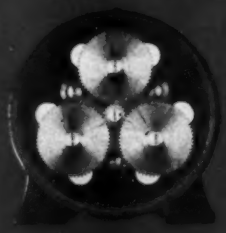
HERRINGBONE REDUCERS

Ratios 1½ to 1 up to 300 to 1 in capacities from 1 to 400 H.P.



WORM GEAR REDUCERS

Ratios 4 to 1 up to 90 to 1 in capacities from ½ to 100 H.P.



SPUR GEAR REDUCERS

Ratios 5-1/2 to 1 up to 200 to 1 in capacities from ½ to 75 H.P.

When you want a speed reducer you want the type that will best handle your particular drive problem . . . and you want a reducer that will "stand the gaff." Jones reducers measure up to both of these standards.

It makes no difference whether you require herringbone, spur or worm gear reducers, the Jones organization can give you just what you need in any ratio and capacity . . . and over the years Jones reducers have shown the ability to "take it" under the most severe operating conditions.

Jones offers your kind of speed reducers to solve your kind of drive problems.

W. A. JONES FOUNDRY & MACHINE CO.
4439 Roosevelt Road, Chicago 24, Ill.

HERRINGBONE — WORM — SPUR — GEAR SPEED REDUCERS
PULLEYS • GEARS • V-BELT SHEAVES • ANTI-FRICTION
PILLOW BLOCKS • FRICTION CLUTCHES • FLEXIBLE COUPLINGS

Jones

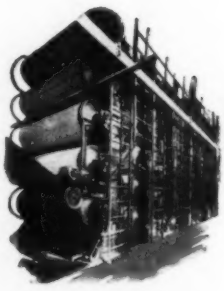
Feathers in the Cap

SHARTLE . . . CONTINUOUS BEATING	Black-Clawson . "HYDRONAMIC" Inlet
BLACK-CLAWSON . . VERTICAL DRYER	DILTS . . . . . HYDRAFINING
DILTS . . . . . HYDRAPULPER	BLACK-CLAWSON . . SEAMLESS DRYER
SHARTLE . . SPECIALIZED JORDANING	DILTS . . . . . CLASSIFINING

SHARTLE . . . BULLDOG & X-66 FILLING

B-C-S-D quite naturally take pride in the fact that in all these categories they have blazed trails plain enough for others to follow. It is axiomatic that only sound ideas win approval—that imitation is the sincerest flattery.

WHEN IN THE MARKET,
GET AN ORIGINAL
—NOT A COPY.

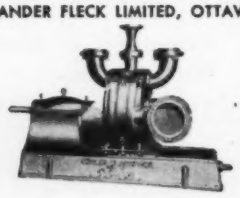


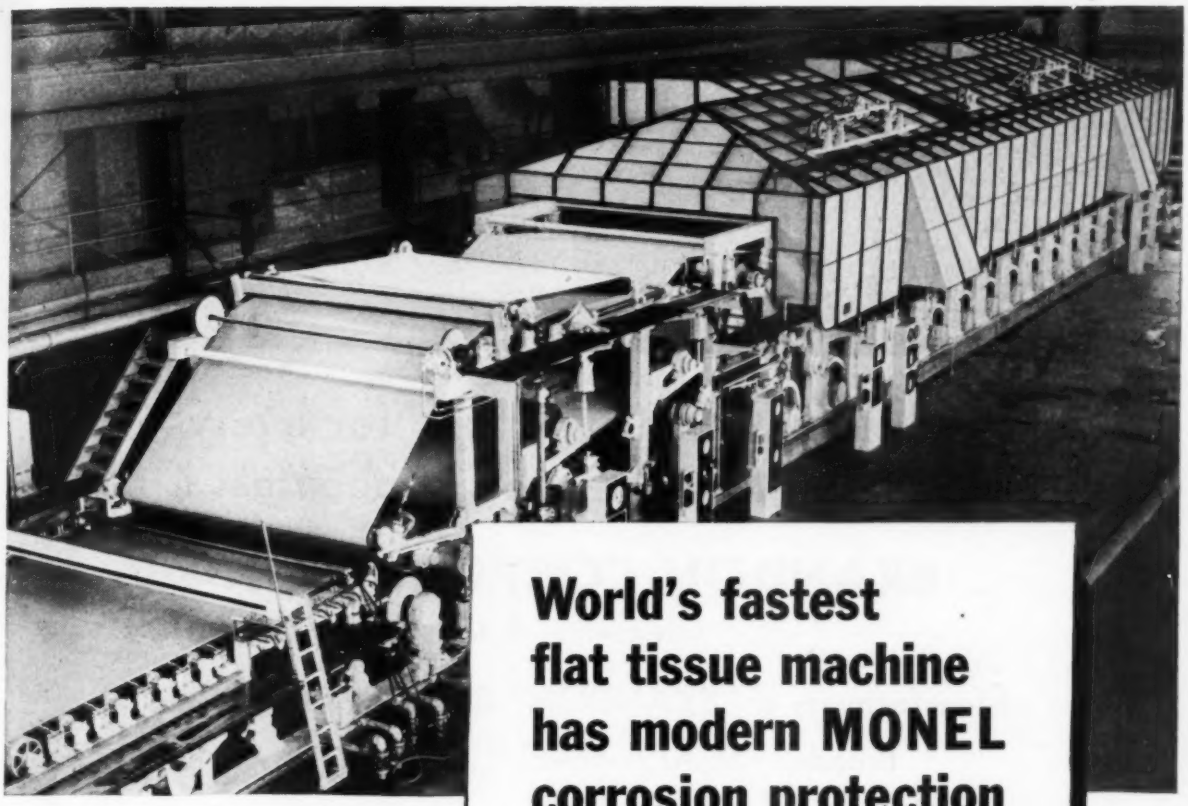
THE BLACK-CLAWSON COMPANY
HAMILTON, OHIO

SHARTLE BROS. MACHINE CO.
MIDDLETOWN, OHIO

DILTS MACHINE WORKS
FULTON, NEW YORK

THE BLACK-CLAWSON CO. (ENGLAND) LTD., MORDEN, ENGLAND
Associate: ALEXANDER FLECK LIMITED, OTTAWA, CANADA





World's fastest flat tissue machine has modern MONEL corrosion protection

A new Black-Clawson flat tissue making machine, fastest of its kind in the world. Installed in Mill No. 3 of the Fernstrom Paper Mills, Pomona, California.

When the Fernstrom Paper Mills of Pomona, California, installed their new Black-Clawson paper making machine, they were sure of two things . . .

The machine was the fastest of its kind in the world.

It would require a minimum of maintenance.

The speed of this giant paper maker is the result of modern design and the skill of its makers. And part of modern design, too, is modern *corrosion protection* in the form of MONEL*. . . insurance against costly shutdowns and high maintenance costs.

This champion of paper making machines is equipped with MONEL suction boxes, MONEL-covered wet end rolls, MONEL saveall trays. Because of the special properties of MONEL, these units will resist the corrosive action of acid and alkaline stocks, white waters, and cleaning solutions . . . *advantages that insure years of trouble-free service!*

MONEL is no stranger to the Fernstrom Paper Mills. Like other leading board and paper mills, they have found that MONEL is an *economy* metal because it lasts longer and needs less maintenance. They have found that it pays to replace vulnerable parts, such as suction box covers, with durable MONEL.

Why not investigate the money-saving possibilities of MONEL for your own mill? Send for your free copy of *"Monel, Nickel, and Inconel in Pulp and Paper Mills."* This illustrated booklet will show you how other mills have solved corrosion and production problems with easy-to-fabricate, versatile INCO Nickel Alloys.

INCO's Technical Service Department is always ready to help you with your special problems concerning corrosion, metal selection and fabrication.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

*Reg. U. S. Pat. Off.

EMBLEM OF SERVICE
INCO
TRADE MARK

MONEL FOR MINIMUM MAINTENANCE

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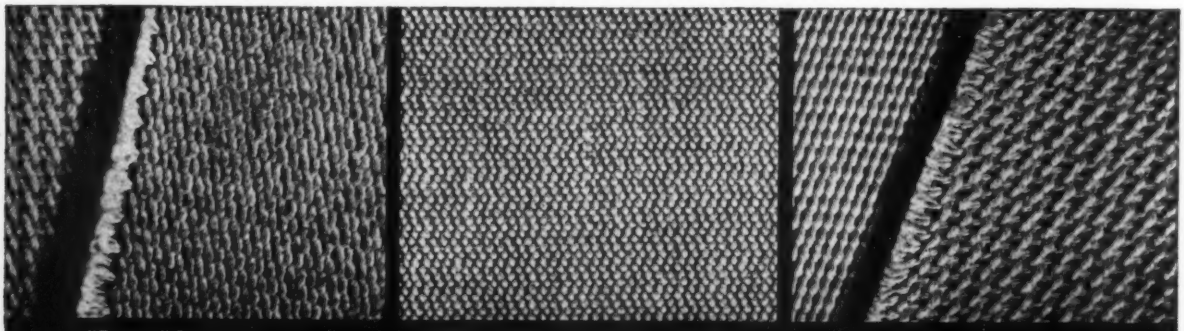

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CHEMICAL USERS' GUIDE To General Chemical Products for the Paper Industry

PRODUCT	AVAILABLE FORMS	COMMERCIAL STRENGTH (MIN.)	SHIPPING CONTAINERS	APPLICATIONS
Aluminum Sulfate $Al_2(SO_4)_3 \cdot 14H_2O$ approx. *(Alum)*	Commercial & Iron Free: Lump, Ground Powdered	17.25% Al_2O_3	Bags Bulk Carloads	Precipitation of rosin size and filler; water clarification; manufacture of satin white; pitch control; mordant for dyes.
Aluminum Sulfate $Al_2(SO_4)_3$ + water *(Liquid Alum)*	Liquid	32° Be (total Al_2O_3 7.2%)	Tank Trucks Tank Cars	Same as commercial dry product but lower strength.
Salt Cake Na_2SO_4 *(Sodium Sulfate)*	White or Grayish Granules	95-99% Na_2SO_4	Bags Bulk Carloads	Used in kraft cooking liquors as the source of Na_2S.
Glauber's Salt, Crystal $Na_2SO_4 \cdot 10H_2O$ *(Sodium Sulfate)*	Colorless Crystals	96% $Na_2SO_4 \cdot 10H_2O$ (42.3% Na_2SO_4)	Bags Barrels	Substitute for salt cake in kraft cooking liquor.
Glauber's Salt, Anhydrous Na_2SO_4 *(Sodium Sulfate)*	White Granules	99.5% Na_2SO_4	Bags Bulk Carloads	Same as Crystal but stronger product.
Sulfuric Acid H_2SO_4	Liquid	66° (93.19%), 99% 20% oleum and higher strengths	Carboys Steel Drums Tank Trucks Tank Cars	Wire scouring; parchmentizing; acid wash in last stage of multi-stage pulp bleaching; neutralizing tall oil soaps.
Sodium Thiosulfate $Na_2S_2O_3 \cdot 5H_2O$ *(Hypo)*	Colorless Crystals	99.75% $Na_2S_2O_3 \cdot 5H_2O$	Bags Fibre Drums	Anti-chlor.
Sodium Sulfite, Anhydrous Na_2SO_3 *("Sulfite")*	White Powder	98.5% Na_2SO_3	Bags Fibre Drums	Anti-chlor.
Sodium Silicate $Na_2O \cdot XSiO_2$ + water *(Water Glass)*	Liquid	38°, 41°, 42° Be; special and higher strengths	Steel Drums Tank Cars Tank Trucks	Adhesive for corrugated and solid fibre board; used in coating mixtures to reduce viscosity and in beater sizing to stiffen paper.
Chromium Potassium Sulfate $K_2SO_4 \cdot Cr_2(SO_4)_3 \cdot 24H_2O$ *(Potash Chrome Alum)*	Red Violet Crystals	99.5% $K_2SO_4 \cdot Cr_2(SO_4)_3 \cdot 24H_2O$	Fibre Drums	Used in "save-all" or white water systems.
Aqua Ammonia NH_4OH + water *(Ammonia)*	Colorless Liquid	26° Be (29.4% NH_3)	Carboys Steel Drums Tank Trucks	Used with chlorine to form chloramines for slime control.
Sodium Fluoride	Powder	90% NaF 95% NaF	Barrels Fibre Drums	Preservative and stabilizer for starch in coating mixtures.
Tetrasodium Pyrophosphate, Anhydrous $Na_4P_2O_7$ *(TSPP) (Pyro)*	White Powder	98% $Na_4P_2O_7$ (Equiv. 52% P_2O_5)	Bags	Felt washing; pitch dispersion.
Nitric Acid HNO_3 + water	Liquid	42° Be 67.2% HNO_3	Carboys Drums Tank Trucks	Nitrating pulp; cleaning monel metal.
Sodium Sulfide Na_2S + water	Red Chips or Solid Mass	60% Na_2S	Steel Drums	Substitute for salt cake in modified soda process.

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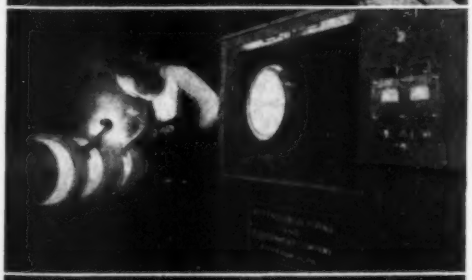

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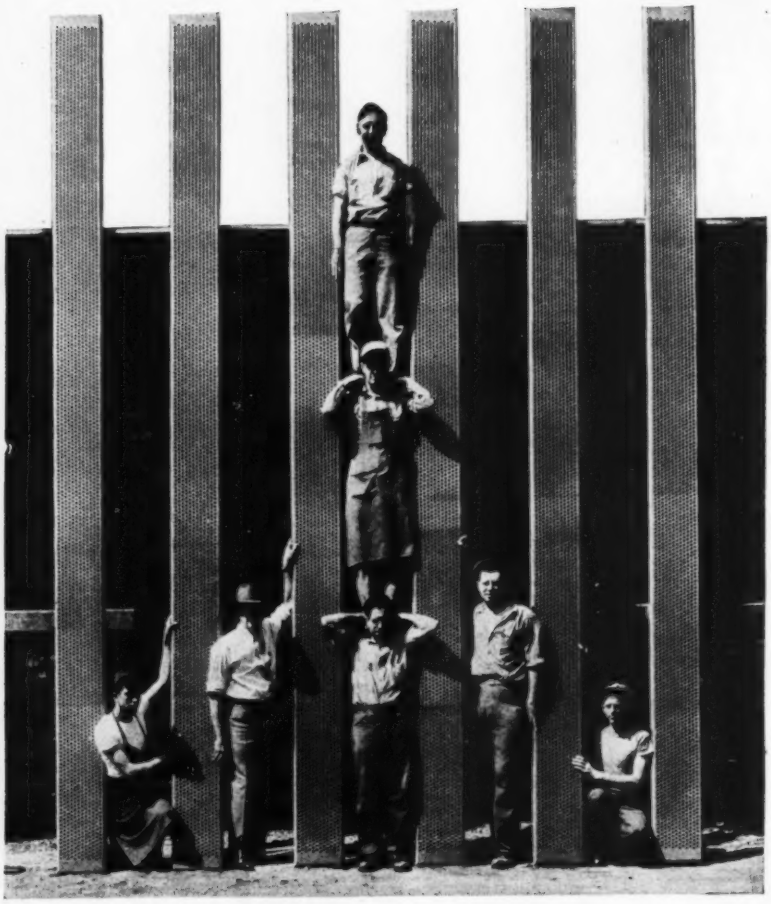

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THE PAPER INDUSTRY
and PAPER WORLD

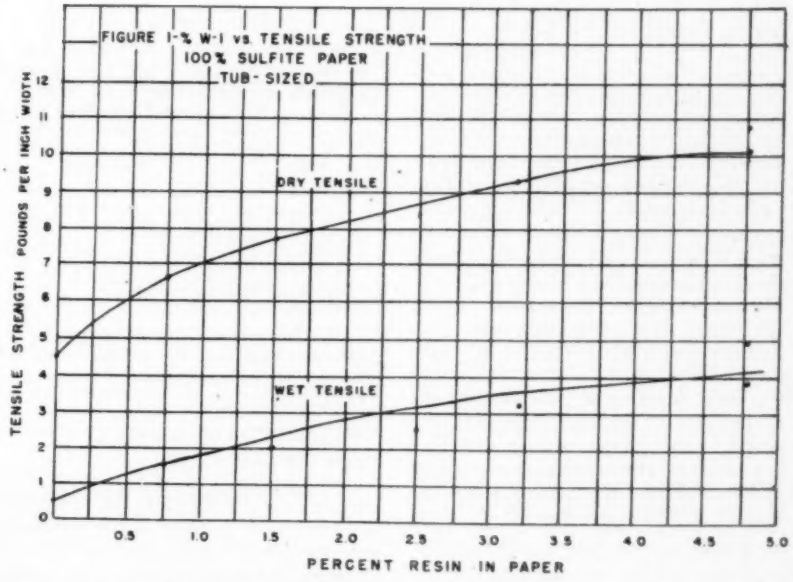
OCTOBER 1948

New Paper Resins

WM. LOUDEN and L. E. KELLEY
Rohm & Haas Company
The Resinous Products Division

▶▶▶ THE USE of synthetic resins to produce wet strength in paper is now well established, and large tonnages of treated papers are produced annually. Generally speaking, these resins are very easy to apply to paper and require little or no special equipment for use. The wet strength produced usually ranges between 15 and 50 per cent of the dry tensile of the original, untreated sheet. Almost since the first day these resins were added to paper pulp, it has been known that properties other than wet strength are improved. Dry tensile and mullen values are usually increased, as are pick, fold, and dimensional stability. Some of the resins are known to improve the efficiency of rosin size and also to have a definite sizing action of their own. With the exception of pick, and possibly dimensional stability, however, the improvements in properties rarely have justified economical use unless wet strength was also required.

Recently while chemists were investigating the possible use of some of the newer synthetic resins as wet strength agents, they found several which improved the dry physical properties of paper far more than conventional wet strength resins. After further work, it was shown that at least one polymer[1] known as "W-1," also produced wet strength which would resist the action of acids for prolonged lengths of time. Only small amounts are necessary to improve the physical properties. Concentrations over three per cent are not recommended.



W-1 is a light-colored, viscous fluid which is infinitely dilutible in water and may be stored at 20 per cent solids for long periods without adverse effect. W-1 is prepared at 20 per cent solids, since higher concentrations are too thick to pour at room temperature. The resin is slightly alkaline and requires only heat or catalyst[2] to convert it to the insoluble stage. W-1 is not substantive to cellulose. It is applied to paper as a dilute solution either at the size press or the calender stack.

In order to determine the effect of W-1 on paper, a sulphite saturating paper made of lightly-beaten stock was passed through a bath containing a three per cent solution of W-1 in water. The sheet was then run through squeeze rolls and allowed to dry at room tem-

(1) Amberlite W-1. Manufactured by The Resinous Products Div., Rohm & Haas Co.

(2) W-1 catalyzed with formaldehyde will slowly convert to the insolubie stage at 75 Fahr. Good results are obtained using 25 per cent formaldehyde solids on W-1 solids. The solids content of aqueous W-1 solution should be 6 per cent or lower when formaldehyde is added. The concentration at which formaldehyde solution is added is not critical.

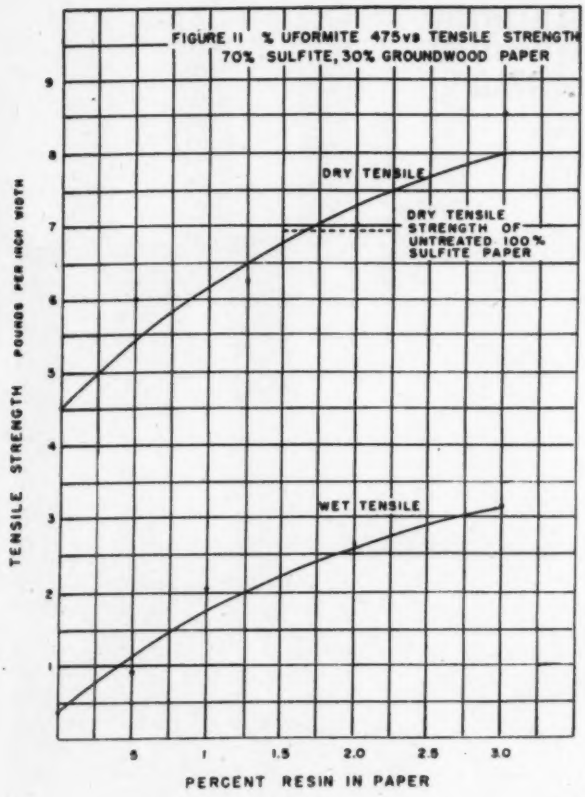


FIGURE II % UFORMITE 475 vs TENSILE STRENGTH
70% SULFITE, 30% GROUNDWOOD PAPER
DRY TENSILE
DRY TENSILE STRENGTH OF UNTREATED 100% SULFITE PAPER
WET TENSILE
TENSILE STRENGTH POUNDS PER INCH WIDTH
PERCENT RESIN IN PAPER

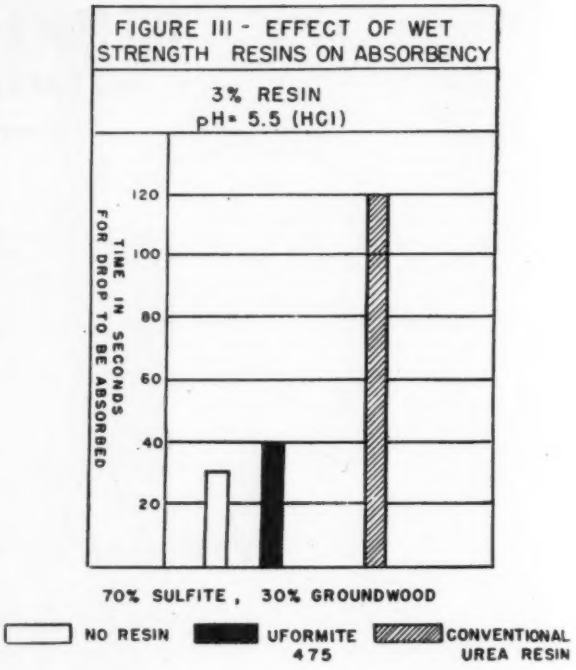


FIGURE III - EFFECT OF WET STRENGTH RESINS ON ABSORBENCY
3% RESIN
pH= 5.5 (HCl)
TIME IN SECONDS FOR DROP TO BE ABSORBED
70% SULFITE, 30% GROUNDWOOD
NO RESIN
UFORMITE 475
CONVENTIONAL UREA RESIN

perature (this is not necessary in commercial operations). Cure of the resin was effected by heating the treated sheet for one minute at 200 Fahr. Tests were run after an aging period of one day at room temperature. Results are summarized in Figure 1 which shows the improvement in dry and wet tensile caused by increasing amounts of W-1. The upper curve shows that small amounts of W-1 cause remarkable improvement in the dry tensile of the base sheet. When only 0.7 per cent resin was used, for example, an increase of 47 per cent in the dry tensile was effected. Although the increase probably would not be as marked in more highly hydrated sheets, it is large enough to suggest serious consideration of this resin as a means of improving dry tensile and mullen.

TABLE 1—Effect of Resin on Wet Tensile

Per cent W-1 in Base Sheet	Per cent Wet Strength 3
0	11
0.7	35
1.5	44
2.5	56

(3) 1-Hour soak in water at 75 Fahr. Dry and wet tensile strengths. Measured with Scott IP-4 Tensile Tester.

The increases in wet tensile are equally great. In Table 1, wet strength is expressed as per cent of the original untreated dry tensile for increasing amounts of resin content. The wet strengths reported in Table 1 are extremely high considering the amount of resin that was used. In order to make certain that part of this wet strength was not due to sizing action, samples of paper were soaked in water at 75 Fahr. for six days. Only slight reductions in wet tensile strength were noted.

In order to test the durability of wet strength produced by W-1, strips of treated paper were placed in water at 140 Fahr. The *p*H of the solution previously had been adjusted to 3.8 with hydrochloric acid. After the paper had soaked for one hour, wet tensile measurements were run. The results are reported in Table 2. Wet strength actually is increased by soaking for one hour at 140 Fahr. On the other hand, it is known that W-1 broke can be recovered easily by soaking the broke in water at a temperature of 140 Fahr. and a *p*H of 10.0 for 10 to 20 minutes. The *p*H should be adjusted with sodium hydroxide.

TABLE 2—Durability of Wet Strength Produced by W-1

Condition	Wet Tensile[4] (Pounds per inch width)
1 hour in water— 75 Fahr.—$_p$H 6.5	3.1
1 hour in water— 140 Fahr.—$_p$H 3.8	4.4

(4) Original untreated dry tensile— 4.5 pounds per inch width

One of the very interesting properties of W-1 is its pronounced effect upon pick resistance. Tests were run according to the standard TAPPI procedure on a sulphite saturating sheet composed of lightly-beaten pulp. Results are summarized in Table 3. It is plain that W-1 has a pronounced effect upon pick resistance. This is not surprising in view of the large increases in dry tensile and mullen caused by the resin.

Fold tests were run on the same sulphite saturating paper using the MIT foldtester and the standard TAPPI procedure. Data are listed in Table 4. The improvement in fold is pronounced and probably is again tied up with the increases in mullen and tensile previously noted.

Tear is almost always an important

TABLE 3—W-1 vs. Pick

Paper	Dennison Wax Number
No Resin	1
3% W-1	9

TABLE 4—W-1 vs. Fold

Condition	Fold
Machine Dir.—No Resin	2
3% W-1	10
Cross Direction, No Resin	1
3% W-1	11

property in paper. Usually, materials which increase mullen and tensile strength have an adverse effect upon tear. In this respect the data in Table 5 are surprising. The standard TAPPI tear test was run using 16 sheets of 100 per cent sulphite saturating paper. In spite of the pronounced increases in general strength characteristics produced by W-1, the polymer has little, if any, effect upon dry tear.

Dry and wet abrasion resistance was measured on a sulphite saturating paper treated with 3 per cent W-1. The TAPPI standard test was followed, using a Taber Abraser with 250-gram weight (See Table 6). It is obvious that both the dry and wet abrasion resistance of the treated paper is greatly improved over the untreated. This is in line with the increase noted in dry tensile and mullen.

During the course of this work it was also noted that the W-1 polymer has a marked sizing action upon paper, as measured by the standard sizing tests. Along this same line, there are indications that the general surface qualities of printing papers can be improved by treatment with W-1.

New Urea-Formaldehyde Resin

Some of the new urea-formaldehyde resins can also be used to effect large changes in physical properties other than wet strength. One resin[5], for example, has a pronounced effect upon dry tensile and mullen and has almost no sizing action on paper. Yet it is still a very efficient wet-strength agent. Greatest improvements in wet and dry properties have been measured on sulphite-groundwood mixtures although sizable increases can also be noted on other pulps.

Three per cent resin solids based upon pulp solids was added to lightly-beaten pulp at the equivalent of the headbox in commercial papermaking operations. The *p*H of the pulp was adjusted to 5.5 with hydrochloric acid. Sheets were made using standard TAPPI procedure and cured for 10 minutes at 210 to 220 Fahr. After a natural aging period of 28 days at 50 per cent relative humidity and 75 Fahr., dry and wet tensile tests were run. The results of this work are summarized in Figure 2.

(5) Uformite 475. Manufactured by the Resinous Products Div., Rohm & Haas Co.

TABLE 5—W-1 vs. Tear

Condition	Tear
Machine Direction—No Resin	47
3% W-1	50
Cross Direction—No Resin	45
3% W-1	45

The curves show that the dry tensile of a 70:30 sulphite-groundwood sheet can be made to equal that of 100 per cent sulphite by adding approximately 2 per cent resin to the pulp before sheet formation. Based upon present prices for resin as well as for sulphite and groundwood pulps, the treatment would be economical.

In order to check the effect the new urea resin would have upon the absorbency of toweling, a test was run comparing it to a conventional urea-formaldehye wet strength agent. Both resins were added to a 70:30 sulphite-groundwood pulp before sheet formation. The

TABLE 6—W-1 vs. Abrasion Resistance

Condition	Abrasion Resistance (Number of Turns) Dry	Wet
No Resin	8	1
3% W-1	Over 500	350

*p*H was adjusted to 5.5 using hydrochloric acid. After an aging period of three months at 50 per cent relative humidity and 75 Fahr. absorbency tests were run using the TAPPI standard method except for the size of the drop. (.018 c.c. used.) The results are shown in Figure 3. The data show that sulphite-groundwood sheets treated with the new urea resin are far more absorbent than papers treated with a conventional urea-formaldehyde resin. This is of great importance in toweling and other absorbent papers where absorbency is a prime characteristic.

Summary

Synthetic resins can be prepared which will markedly improve almost all of the important dry and wet properties of paper. Relatively small amounts of resin are needed to do this. Application is simple and requires no special equipment.

Experiments indicate that the new W-1 polymer will improve the wet tensile, mullen, tear, and abrasion resistance of paper. Dry tensile, mullen, pick resistance, fold, abrasion resistance, and printability are all greatly improved.

A new urea-formaldehyde resin has been synthesized which, in comparison with other wet strength agents, has little if any effect upon the absorbency of paper. The resin also greatly improves dry tensile and mullen of treated paper, particularly sulphite-groundwood stocks.

Physical and Human Resources Inseparable*

▶▶▶ WE ARE ACTUALLY entering that era when the tools of good personal administration become the tools which the line executive uses to get the operating job done. Physical resources and human resources will no longer be subjects of independent and separate considerations. One can no longer be separated from the other.

Analysis of operating problems will be approached through the analysis of human problems. The solutions to lowering profits, sinking sales, increasing costs, unbalanced inventories, weakening sales promotion and slipping markets will be found in the solutions to poor selection of people, inadequate training, stupid supervision, bad salary and wage administration, poor working conditions, haphazard methods of promotion, ineffective incentives, etc. There is no operating problem that cannot be uncovered and there are none that can be solved as quickly or completely as through the careful use of personnel inventories.

"Inventory" is a word common to all. It is so common and so well understood that I doubt many have bothered to observe its definition in the dictionary. An inventory is "a summary, listing of stock, materials, equipment and *personal qualifications.*" Few of us have realized that a summary or listing of human values is just as much a part of a complete inventory of a business as is the summarization of stock, materials, and equipment.

When a management, from the top to first line supervision, puts the same amount of time, effort and skill into the inventory of personal qualifications as it does into the proper evaluation of its physical resources, the result is nothing short of astounding.

(*) Excerpted from address by Lawrence A. Appley, president American Management Association, New York, presented before the annual convention of the American Gas Ass'n, Atlantic City, October 6, 1948.

The Wood Chipper---Part 2

H. W. ROGERS, Engineering Consultant
Paper and Textile Division
Industrial Engineering Divisions
General Electric Company

▶▶▶ AS A CHECK against the theoretical analysis of chippers, exhaustive oscillographic tests were made on several chippers while chipping various kinds of wood and in all cases the tests were made on measured logs so that accurate information was available on the number of cubic feet cut.

Oscillographic Tests

All of these tests were thoroughly analyzed with a planimeter to determine the chipping time, the average load, the peak load and the kilowatt seconds per cubic foot of wood cut.

Table 3 gives the analysis of tests made at a northern plant on an 84-in, 10-knife, chipper where the sample logs were confined to Maine and Nova Scotia spruce. The chipper was driven by a 300-hp, 360 rpm, d-c synchronous motor and the chips were 0.625 in long.

Figure 14 is a plot of the data in Table 3 and shows an average value of 211 kw seconds, or 283 hp seconds per cu ft for spruce. Figure 14 also shows a plot of the average kilowatt output load for different diameter logs, based on 211 kw seconds per cu ft, together with the actual output loads encountered in the tests.

Further tests were made at a southern plant on a 100-in, 10-knife chipper driven by a 300-hp, belted, slipring motor and a 96-in, 6-knife chipper driven by a 300-hp, 257 rpm, direct-connected synchronous motor.

The 100-in chipper was belted for a maximum speed of 279 rpm and was cutting 0.507 in chips, while the 96-in chipper was cutting 0.610-in chips.

Data from these tests are tabulated in Table 4 and plotted in Figure 15.

It must be recognized that the shear values for wood vary, even for the same species and the same moisture content, and of necessity we must deal with averages. Also, that while it is general practice to chip logs with approximately 20 per cent moisture, this may vary somewhat, one way or the other.

The oscillographic tests made cover not only Maine and Nova Scotia spruce but also yellow pine, gum, poplar, and maple for each of which we have the average kilowatt seconds per cu ft of wood chipped. A comparison of these data with the shear values established by the U.S. Forest Products Laboratory leads to the conclusion that the power required to chip wood is definitely a function of the shear value, and if this be true, it is possible to establish within close limits the kilowatt seconds required to chip any species of wood.

The results of this comparison and the values derived therefrom are tabulated in Table 5 and it is suggested that these values be used in the selection of motor ratings. It should be recognized, however that the paper mill today is not confined to one species of wood: that frequently oak, hickory, elm, maple, and other hardwood logs find their way into the mill and, therefore, the motor must be able to handle the largest size logs of these species if shutdowns are to be avoided.

Insofar as the capacity of a chipper in cords per hour is concerned, since the power required varies directly with the square of the log diameter, the maximum production occurs when logs 63.3 per cent of the maximum diameter are fed continuously, end on end, to the chipper. The motor will carry this continuously if it has 250 per cent pull-out torque.

Logs of larger diameter than this cannot be fed continuously and, therefore, result in a low production, while logs of smaller diameter, even though they permit of chipping two, three, or four at a time, also result in a lower production.

However, the actual production required of a chipper is so small com-

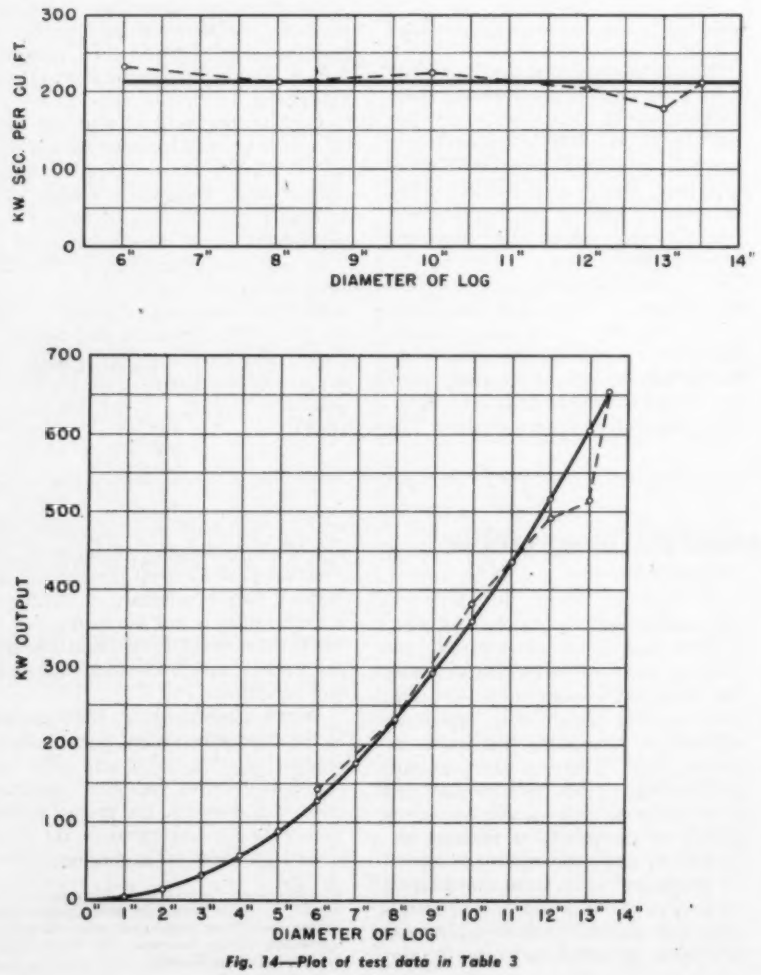


Fig. 14—Plot of test data in Table 3

TABLE III

TEST	WOOD CHIPPED KIND	D	L	CU FT	MOTOR INPUT KWS	MAX KW	AVG KW	CHIPPER RPM MIN	MAX	AVG	MOTOR OUTPUT TIME TO CUT	AVG KW	KWS PER CU FT
10	NSS	6	24	.395	121.2	280	189		300		.64	176	285
11	"	6	24	"	129.2	-	202		"		"	188	304
21	MS	6	24	"	92.4	211.5	144		"		"	135	219
22	NSS	6	24	"	93.5	220.5	146		"		"	137	222
7	"	6	48	.785	211.5	264	165		"		1.28	155	256
9	"	6	48	"	120.3	123.2	94		"		"	90	147
25	"	6	48	"	169.6	235	132.5		"		"	124	202
3	MS	8	24	.70	96.6	220.5	151		"		.64	142	130
12	NSS	8	24	"	147.8	345	231		"		"	215	197
18	NSS	8	24	"	193	-	302		"		"	280	256
19	"	8	24	"	159.3	396	249		"		"	232	212
6	"	8	48	1.40	385	487	301		"		1.28	280	256
26	"	8	48	"	333	437	260		"		"	243	222
33	"	8	48	"	339.5	425	265		"		"	246	225
34	MS	8	48	"	302	314	236		"		"	220	201
4	"	10	24	1.092	306	336	476		"		.64	442	259
20	"	10	24	"	189	405	296		"		"	276	161
23	NSS	10	24	"	258	566	403		"		"	375	220
24	MS	10	24	"	294.5	602.5	460		"		"	425	249
27	NSS	10	48	2.185	509	616	398		"		1.28	371	217
31	"	10	48	"	563.5	605	440		"		"	410	240
32	MS	10	48	"	492	504	385		"		"	359	210
35	NSS	10	48	"	560	650	438		"		"	407	238
1	"	12	24	1.57	364	720	569		"		.64	525	214
2	"	12	24	"	307.5	603	480		"		"	446	182
13	"	12	24	"	344.5	663	537		"		"	498	203
16	"	12	24	"	317	635	496		"		"	458	187
17	"	12	24	"	343.5	658	536		"		"	498	203
5	"	12	48	3.14	768	800	600		"		1.28	555	226
8	"	12	48	"	566	-	443		"		"	412	168
28	"	12	48	"	760	745	610		"		"	560	228
29	"	12	48	"	744	728	582		"		"	535	218
30	MS	12	48	"	598	426	467		"		"	433	176
15	NSS	13	48	3.69	710	744	555		"		"	513	177
14	"	13½	24	1.99	456	810	713		"		.64	658	212

* NSS - Nova Scotia Spruce
MS - Maine Spruce

pared to its maximum production that few chippers ever operate continuously.

The curve in Figure 16 shows the relative capacity for different diameter of logs, but it applies only to synchronous motors with 250 per cent pull-out torque and should not be used for induction motors where the stored energy of the chipper is used to assist in cutting logs.

Selection of Motor Rating

It is, of course, possible to use the synchronous motor, the slip-ring motor, or a high-resistance squirrel-cage motor on a chipper, the latter two types being used only where advantage is to be taken of the high inertia or flywhel effect of the disc to aid in chipping the logs. But under these conditions it is customary to supplement the disc inertia with a heavy flywheel or flywheel pulley since the benefit derived from the disc alone is not sufficient.

Where synchronous motors are used, it is common practice to direct-connect them to the chipper, and while many of these motors have been designed with their own bearings and shaft for coupling to the chipper shaft, the majority of those recently furnished, except the largest one, have been furnished without shaft and bearings for direct-mounting on the chipper shaft. Many of the smaller motors have been overhung, but by and large most of them

TABLE IV

TEST	WOOD CHIPPED KIND	D	L	CU FT	MOTOR INPUT KWS	MAX KW	AVG KW	CHIPPER RPM MIN	MAX	AVG	TIME TO CUT	MOTOR OUTPUT AVG KW	KWS/ CU FT
1*	Pine	6 7/8"	60"	1.29	255	134.5	100	279	279	279	2.55	95.6	189
2	Pine	8 1/8"	61"	1.83	372	248	143.5	279	279	279	2.59	135.8	192
3	Gum	10 1/2"	66"	3.31	610	414	218	279	279	279	2.8	203	172
4	Pine	12 1/8"	59½"	3.98	1034	452	442	275	279	277	2.54	424	270
6	Gum	14 5/8"	67"	6.5	1563	-	550	279	279	279	2.85	523	229
5	Pine	15 1/2"	61½"	6.71	1850	521	705	279	279	279	2.61	682	265
13	Gum	16 1/4"	63½"	7.85	2440	581	835	235	279	257	2.93	808	301
7	Gum	16 1/2"	61½"	7.61	2535	-	966	278	279	278.5	2.62	939	323
8	Pine	17 1/8"	60"	8.0	1835	511	716	277.5	279	278.7	2.55	695	222
41	Gum	18 1/2"	79½"	12.38	3550	878	955	228	279	253.5	3.71	922.5	276
39	Maple	20"	81"	14.75	5325	865	1283	182	279	230.5	4.15	1236	348
40	Poplar	20 1/4"	57½"	10.73	3350	865	1220	214	279	246.5	2.75	1180	302
38	Pine	22 3/4"	61½"	14.42	4495	871	1475	198	279	238.5	3.04	1430	301
16#	Pine	6 1/2"	64"	1.23	297	107	73		257		4.07	67	222
18	Pine	8 3/4"	60½"	2.11	602	290	156.5		257		3.85	146	256
20	Pine	10"	58"	2.64	773	382	209		257		3.7	196	274
23	Gum	12 1/2"	80"	5.68	1505	450	295		257		5.09	273	244
24	Gum	12 1/2"	87"	6.17	1550	443	280		257		5.54	260	233
21	Pine	13"	71"	5.45	1010	390	223		257		4.52	207	172
14	Pine	13 1/2"	56½"	4.78	1216	535	337				3.6	313	236
25	Gum	13 1/2"	86"	7.12	2155	512	394				5.47	365	281

(*) This series of tests made with a 100", 10-knife Chipper, 279 RPM, 300 HP Slip Ring Motor, Chips 0.507 inch.
(#) This series of tests made with a 96", 6-knife Chipper, 257 RPM, 300 HP Syn. Motor, Chips 0.61 inch.

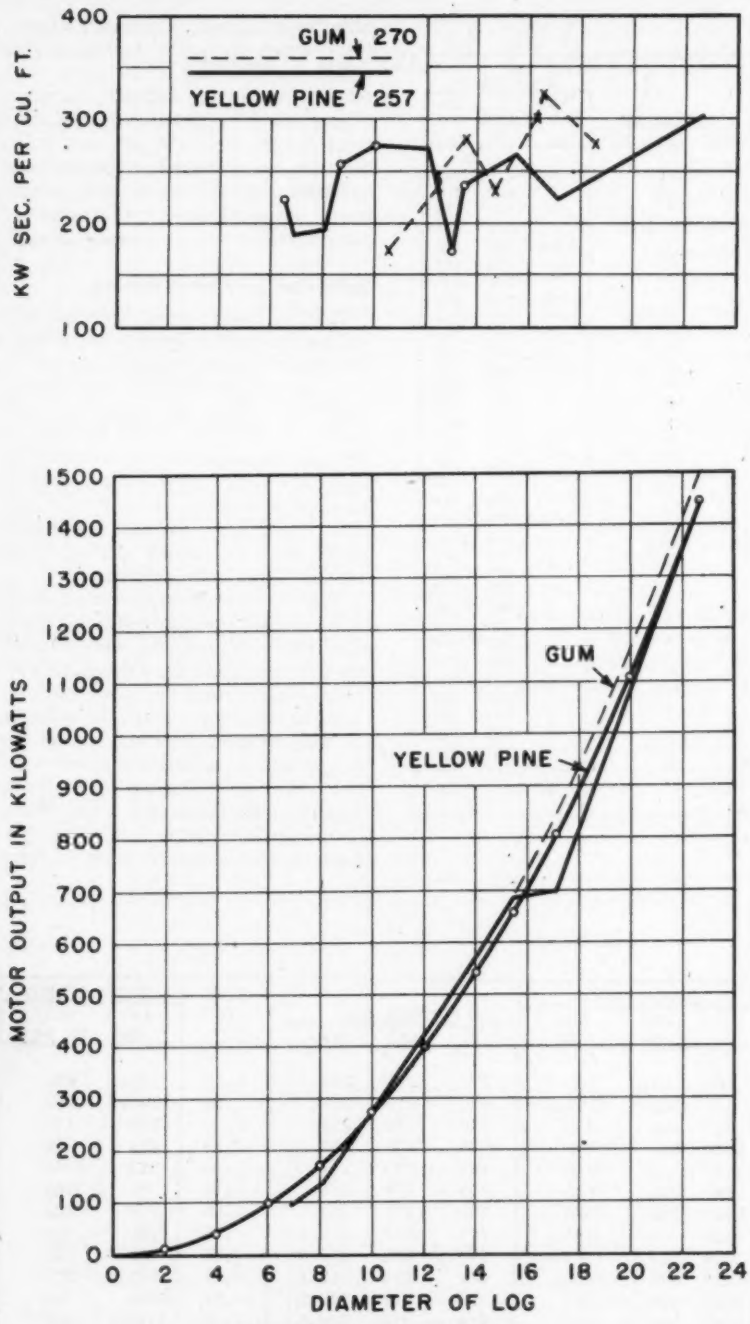


Fig. 15—Plot of test data in Table 4

have been mounted between the chipper bearings with the chipper disc.

On the other hand, while the slip-ring induction motor or high-resistance squirrel-cage induction motor may be direct-connected, it is not uncommon practice to belt them. Of course, the sole object of using an induction motor is to take advantage of the flywheel effect and minimize peak loads, and, incidentally, use a smaller rated motor. This is only possible, however, where the cutting time is of short duration with a sufficient lapse in time between logs to permit the chipper to attain full speed again. Even so, this procedure not only interferes with the maximum production, but requires more energy than the synchronous motor because the energy taken out of a flywheel always has to be restored, and at a loss.

Since the maximum power requirement of a chipper is a function of the speed, the number of knives, the length of chip, the maximum diameter of log to be used, and the kind of wood, and since the horsepower seconds per cubic foot of wood already has been tabulated, the simplest method of determining the power requirement is to use the values in Tables 5 and 6. These values give the horsepower seconds per cubic foot and the cubic feet per second for various diameters of logs, these diameters being the maximum to be handled.

The maximum horsepower requirement may then be calculated from the formula:

$$\text{Max. hp} = \text{cu ft per sec} \times \frac{\text{rpm}}{100} \times \text{hp sec per cu ft} \qquad (I)$$

and the maximum production in cords per hour for a synchronous motor drive may be calculated from the formula:

$$\text{Max. Cords per hour} = \frac{\text{cu ft per sec} \times \frac{\text{rpm}}{100} \times 3600 \times 0.633}{85} \qquad (II)$$

Where synchronous motors are used, it is most economical to adhere to a maximum pull-out torque of 250 per cent and, having determined the maximum horsepower requirements from the formula (I), it is only necessary to divide this by 2.5 to ascertain the nominal horsepower rating of the motor.

In some few instances, requests have been made for synchronous motors with 300 and even 400 per cent pull-out torque, apparently with the idea of being able to handle the largest diameter logs with a motor of smaller nominal rating than would be possible if 250 per cent pull-out torque were used. This is a fallacy, and the practice should

TABLE V

HORSEPOWER SECONDS PER CUBIC FOOT OF WOOD REQUIRED FOR CHIPPING	
Ash	458
Beech	500
Birch	500
Cherry	428
Douglas Fir	296
Elm	434
Gum (Black)	362
Gum (Red)	425
Hemlock	300
Hickory	541
Locust	600
Larch	347
Maple	465
Maple (Sugar)	580
Oak (Red)	486
Pine (Yellow)	344
Poplar	297
Spruce	283
Sycamore	388
Tamarack	322
Walnut	384

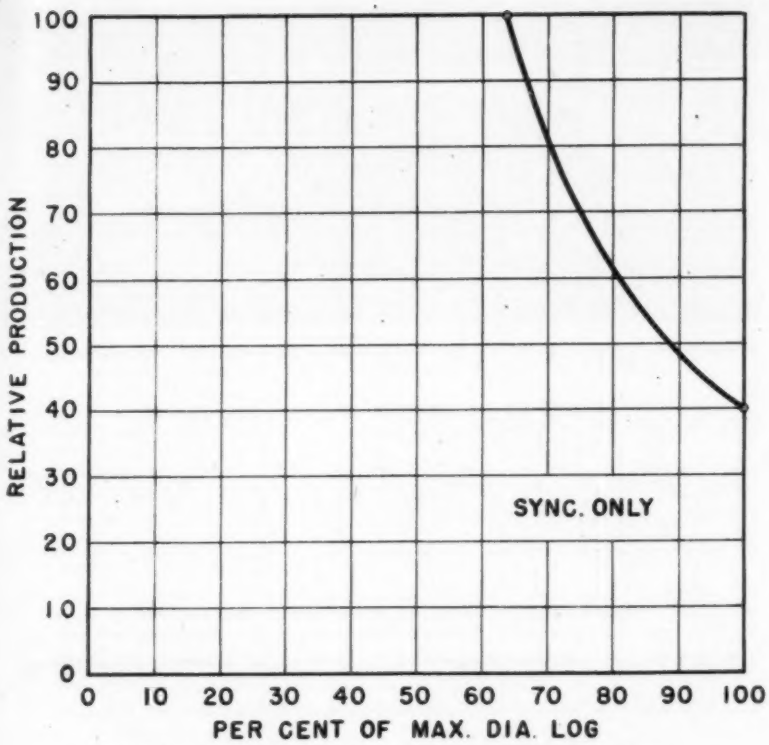


Fig. 16—Continuous production of chipper for various diameter of logs

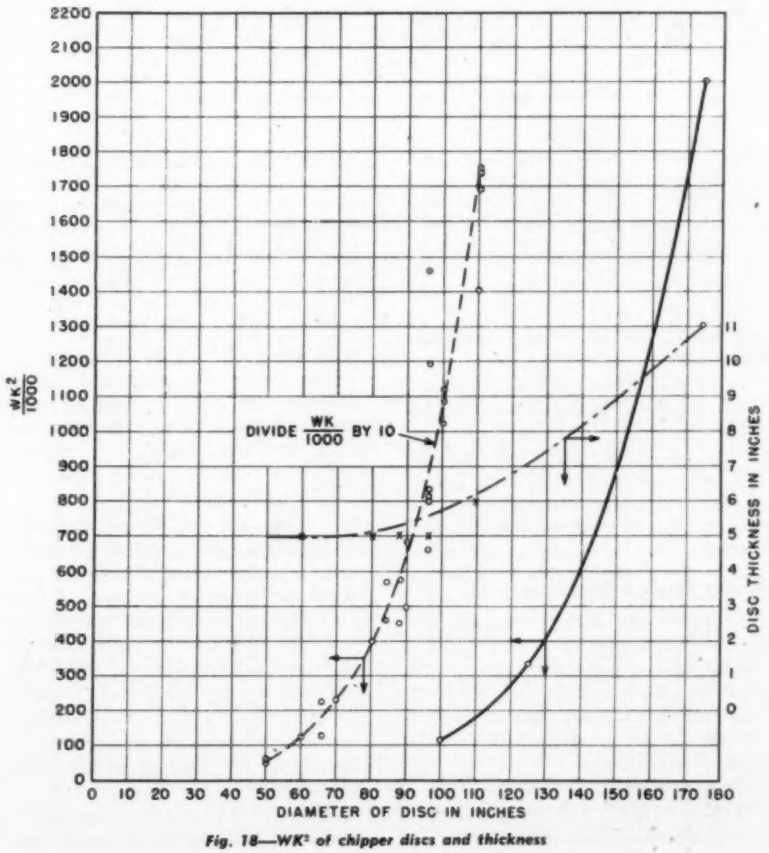


Fig. 18—WK² of chipper discs and thickness

not be followed because the maximum torque requirement determines the frame size.

With the induction motor, one must know the WK^2 of the chipper and flywheel, decide how much it will be permitted to slow down, how much energy it will give up, and deduct this from the total energy required. The difference must be supplied by the motor, which should not exceed 200 per cent normal load under the maximum slowdown conditions.

The stored energy in a flywheel may be calculated from the formula:

$$SE = \frac{WK^2 N^2}{3\,234\,000} = \text{horsepower seconds} \quad \text{(III)}$$

where N = rpm

and the percentage of energy it gives up in slowing down to various percentages of its maximum speed is indicated in Figure 17.

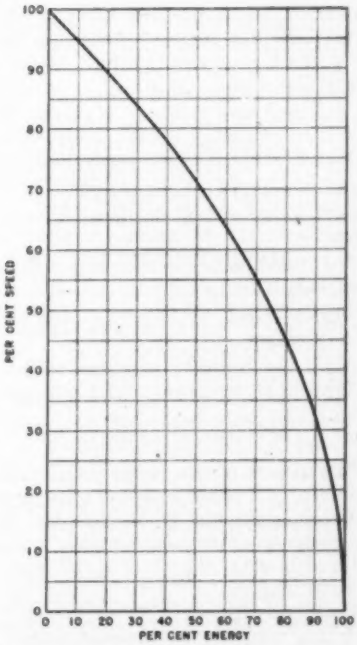


Fig. 17—Per cent energy given up by flywheel when slowing down

Approximate values of the WK^2 of chipper discs are given in Figure 18 but to these values must be added any WK^2 incorporated in flywheels or flywheel pulleys.

As an example, let us assume that we have a 100-in diameter chipper with 10 knives, operating at 300 rpm cutting 0.75 in chips and the largest size log to be handled is 24 in in diameter.

If spruce is used entirely, the maximum load will be: See Tables 5 and 6.

$$3.27 \times \frac{300}{100} \times 283 = 2780 \text{ hp}$$

$$\text{or } \frac{2780}{2.5} = 1110 \text{ hp nominal rating}$$

The maximum continuous production will be:

$$\frac{3.27 \times \frac{300}{100} \times 3600 \times 0.633}{85} =$$

263 cords per hour

Since the hp seconds for gum (black) is 362, the load produced by chipping gumwood will be:

$\frac{362}{283}$ = 1.29 times that for spruce,

and since the load varies as the square of the log diameter, this chipper could handle a 21-in diameter gum log without exceeding the load caused by a 24-in diameter spruce log.

Now, suppose that this same chipper under identical conditions is to be driven by a slip-ring induction motor, utilizing the stored energy to assist in chipping the log. From Figure 18, the WK^2 of the chipper disc is approximately 110,000 pounds feet squared, but as is customary, an additional flywheel is used to increase this to 220,000 WK^2. Let us also assume that the log is 60 inches long which gives a total of:

$$\frac{12 \times 12 \times 3.14 \times 60}{1728} =$$

15.73 cu ft in a 24-in diameter log

and an energy consumption of:

$15.73 \times 283 = 4450$ hp seconds to cut the log.

The stored energy in the chipper from formula III is:

$$\frac{220{,}000 \times 90{,}000}{3{,}234{,}000} = 6125 \text{ hp seconds}$$

and if the chipper is permitted to slow down to 80 per cent speed it will give up:

$6125 \times .36 = 2210$ hp seconds.

The balance of the energy required or 4450 — 2210=2240 hp seconds must be supplied by the motor, and since the average speed while cutting the log is approximately 90 per cent of full speed, it will require:

$$\frac{15.73}{3.27 \times 3 \times .9} = 1.785 \text{ seconds to chip}$$

The average load carried by the motor will be:

$$\frac{2240}{1.785} = 1250 \text{ hp}$$

whereas the peak, assuming only 200 per cent in this case will be 2520 hp, showing that there is little to be gained under these conditions by using the induction motor.

If, however, the added flywheel is twice that of the chipper disc, making the total WK^2 330,000 pounds feet squared, the energy given up by the flywheel will be 3300 hp seconds and the motor will have to supply only 1150 hp seconds, or an average load during chipping of $\frac{1150}{1.785} = 643$ hp

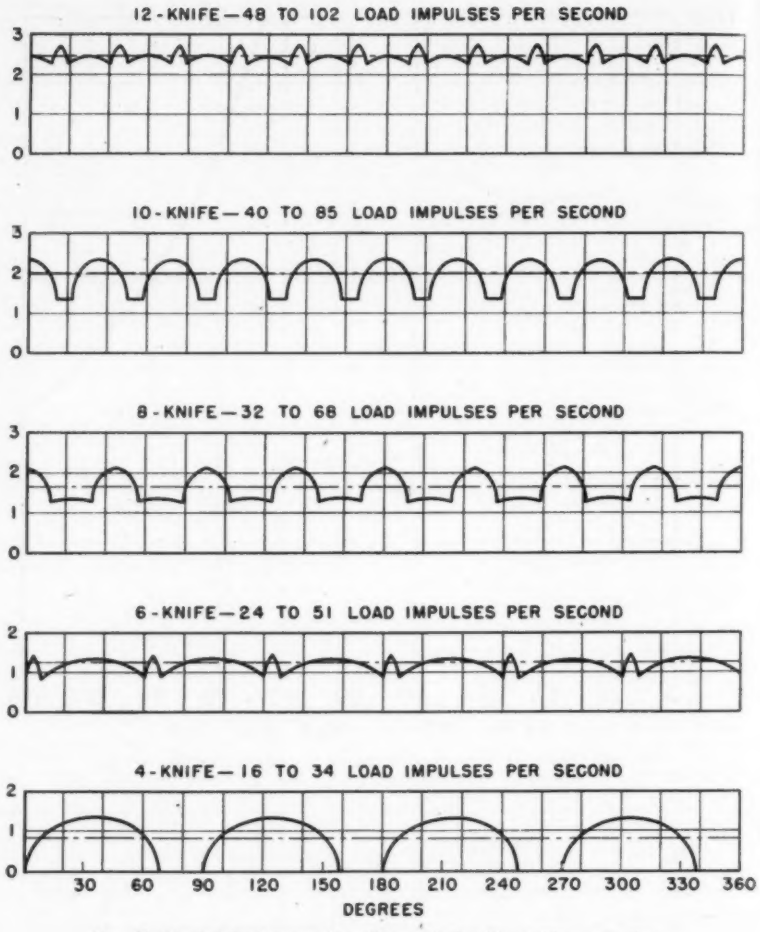

12-KNIFE—48 TO 102 LOAD IMPULSES PER SECOND
10-KNIFE—40 TO 85 LOAD IMPULSES PER SECOND
8-KNIFE—32 TO 68 LOAD IMPULSES PER SECOND
6-KNIFE—24 TO 51 LOAD IMPULSES PER SECOND
4-KNIFE—16 TO 34 LOAD IMPULSES PER SECOND
30 60 90 120 150 180 210 240 270 300 330 360
DEGREES

Fig. 19—Typical load curves for chippers during the cutting operation

which really shows some benefit from the flywheel. However, the continuous rating of this motor is small compared with the synchronous motor, and the maximum continuous production of the chipper is only $\frac{643 \times 0.9}{1110} = 51.5$ per cent of that possible with the synchronous motor.

It would appear, therefore, that any additional flywheel should have at least twice the inertia of the disc itself to be of any real value, and even then the continuous production of the chipper should be checked very carefully to be sure that it will meet the required production.

Motor Design Features

Chipper duty is rather rugged and there are several features in the motor design which should be given careful attention to insure successful operation.

Where synchronous motors are involved, the torque requirements have been standardized as:

Starting torque	50 per cent
Pull-in torque	60 per cent
Pull-out torque	250 per cent

and since the amortisseur winding must have heat storage capacity sufficient to absorb the entire stored energy in the revolving element when it is up to full speed, without excessive heating, this factor may have more influence in determining the motor size than the maximum diameter of the log.

Motors with both 40 C rise and 50 C rise have been used successfully, although the 50 C continuous rated motor lacks the service factor which might well be desirable if it ever becomes necessary to step up production to meet an emergency.

For instance, on the maximum diameter log the 50 C motor can operate only 16 per cent time, whereas the 40 C motor can operate 21.25 per cent time. Also the 40 C motor can operate continuously on logs 67.8 per cent of the maximum diameter instead of 63.3 per cent, as is the case with the 50 C motor, and produce 15 per cent more chips.

The motor should definitely be designed for 0.8 leading power factor, and since this will drop back to approximately 0.85 per cent lagging under peak load conditions, it would seem

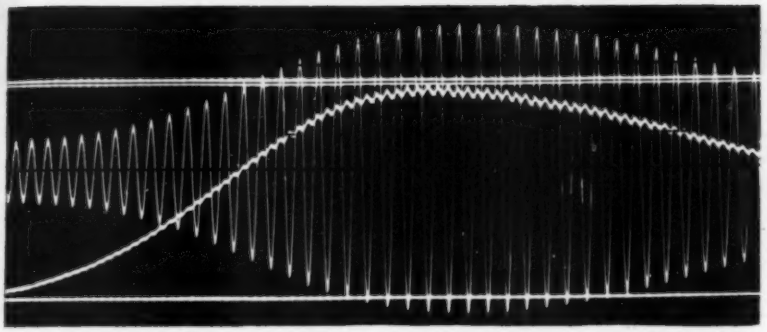


Fig. 20—Oscillogram of a wood chipper clearly showing the knife impulses and the extent to which the peak loads are absorbed by the heavy inertia of the chipper disc

advisable to use field forcing under maximum load conditions to minimize system disturbances, and this can be very readily accomplished.

As previously stated, chippers are designed to cut chips from 0.875 in to 0.5 in long, and provision is made to adjust the knives in the disc to meet this requirement. On some makes of chippers, therefore, where the motor is mounted directly on the chipper shaft, provision must be made for a lateral movement of the rotor within the stator. This is usually 1.5 in when required, but it is not required on all chippers, nor is it essential where the motor has its own bearings and shaft, as the coupling takes care of this condition.

Axial movement of the stator frame to permit of complete rotor inspection, while not general practice, has been furnished in some cases.

Motors for this service are of the open type and of much heavier construction than general-purpose motors. Much heavier steel plates, thoroughly reinforced, are used in both stator and rotor construction and the stator end windings are braced against the shock loads.

Where rotors are overhung on the chipper shaft tapered bores are usually required, and where the rotor is mounted between chipper bearings, it is not uncommon to furnish split rotors.

Screened end shields are general on the chipper side of the motor.

The terrific shock load incident to chipper operation stresses a condition which must not be overlooked if successful operation is to be maintained. All rotating masses have a natural period of oscillation, and if the load impulses coincide with this natural period of oscillation the results may well be disastrous. Normally, it is advisable to have the load impulses well above the natural period of oscillation, and this may be accomplished by interposing some flexible link between the motor and the chipper. Strange as it may seem, this situation may be corrected by reducing the shaft diameter slightly, whereas the natural tendency might be to make it large enough to withstand any load.

The condition cited above may be encountered on the 4- and 6-knife chippers, but it is seldom that the 8-, 10-, and 12-knife chippers are involved because of the high frequency of the load impulses.

Figure 19 shows the typical load cycle curves, while cutting on 4-, 6-, 8-, 10-, and 12-knife chippers operating at normal speeds, also the range in frequency of load impulses. In some instances the peak loads are considerably above the average load, but these peaks occur so rapidly that they are smoothed out by the flywheel effect of the chipper and the motor only sees the average load. This is clearly shown in the oscillogram in Figure 20.

However, the frequency of the load impulses are important and must be considered in any motor application.

This installment concludes the article by Mr. Rogers. Part One was published in the September (1948) issue of this magazine.

TABLE VI

CUBIC FEET PER SECOND PER 100 RPM

Dia of Log	0.75-IN CHIPS NUMBER OF KNIVES					0.625-IN CHIPS NUMBER OF KNIVES					0.50-IN CHIPS NUMBER OF KNIVES				
	4	6	8	10	12	4	6	8	10	12	4	6	8	10	12
4	.0364	.0531	.0728	.091	.1092	.0304	.0456	.0608	.076	.0912	.0182	.0273	.0364	.0455	.0546
6	.082	.123	.164	.205	.246	.0685	.103	.137	.1714	.2056	.042	.063	.084	.105	.126
8	.1455	.218	.291	.364	.4365	.1215	.182	.243	.304	.3645	.0727	.109	.1454	.182	.2181
10	.227	.340	.454	.568	.681	.1892	.284	.3784	.473	.5676	.1135	.171	.227	.284	.3405
12	.327	.491	.654	.817	.981	.273	.410	.546	.683	.819	.1635	.245	.327	.408	.4905
14	.445	.668	.89	1.113	1.335	.371	.556	.742	.928	1.113	.2225	.334	.445	.556	.6675
16	.581	.871	1.162	1.453	1.743	.485	.728	.970	1.213	1.455	.291	.436	.582	.727	.873
18	.735	1.104	1.47	1.84	2.205	.613	.920	1.226	1.532	1.839	.3675	.551	.735	.918	1.1025
20	.910	1.365	1.82	2.275	2.73	.759	1.14	1.518	1.90	2.277	.455	.682	.910	1.137	1.365
22	1.10	1.65	2.20	2.75	3.30	.916	1.375	1.832	2.29	2.748	.550	.832	1.10	1.39	1.65
24	1.31	1.965	2.62	3.27	3.93	1.093	1.64	2.186	2.73	3.279	.655	.983	1.31	1.64	1.965
26	1.535	2.30	3.07	3.84	4.605	1.28	1.92	2.56	3.20	3.84	.7675	1.152	1.535	1.92	2.3025
28	1.83	2.75	3.66	4.58	5.49	1.526	2.29	3.052	3.82	4.578	.915	1.372	1.83	2.29	2.745
30	2.05	3.07	4.10	5.12	6.15	1.710	2.57	3.42	4.27	5.13	1.025	1.537	2.05	2.56	3.075
32	2.325	3.49	4.65	5.82	6.975	1.94	2.91	3.88	4.85	5.82	1.163	1.745	2.326	2.91	3.489
34	2.625	3.94	5.25	6.57	7.875	2.19	3.28	4.38	5.47	6.57	1.312	1.97	2.624	3.28	3.936
36	2.94	4.41	5.88	7.35	8.82	2.45	3.68	4.90	6.12	7.35	1.47	2.11	2.94	3.67	4.41
38	3.28	4.92	6.56	8.20	9.84	2.74	4.11	5.48	6.85	8.22	1.64	2.46	3.28	4.10	4.92
40	3.63	5.45	7.26	9.08	10.89	3.03	4.55	6.06	7.58	9.09	1.82	2.73	3.64	4.55	5.46
42	4.01	6.01	8.02	10.02	12.03	3.34	5.01	6.68	8.35	10.02	2.005	3.01	4.01	5.01	6.015

Rate of chipping wood in cu ft per sec per 100 rpm for various maximum diameter of logs with 4-, 6-, 8-, 10-, and 12-knife chippers and 1/2-in, 5/8-in, and 3/4-in length of chips.

A Balanced National Tariff Program

WARREN B. BULLOCK, Manager
Import Committee of the American Paper Industry

▶▶▶ AT THE OUTSET it should be clearly understood that in this discussion of what the writer believes to be a balanced national tariff program he is expressing personal opinions which may or may not reflect the best thought of the paper industry.

One point, however, should also be equally clearly understood; that is, since 1922 the American Paper Industry has consistently and repeatedly urged that the United States tariff laws should be so written and construed that they will give the American manufacturer an even chance—and no more than an even chance—in his home markets in competition with foreign producers who may have the advantage of lower wage standards, and consequently lower costs.

To assure this equality of opportunity in his home market something more than mere rates of duty is involved. Methods of administration, standards of valuation, protection against unfair foreign procedures, in many cases, may have a more serious impact on domestic producers than low rates of duty.

Winston Churchill once declared it was not his opinion that he was named Premier of the British Empire to preside over its dissolution. Paraphrasing his pronouncement, it is not the province of the Government at Washington to preside over the bankrupting of American industry, or any of its segments.

Self-preservation is the first law of nature, for industry as well as individuals. A strongly held industrial theory (not supported in certain high governmental quarters) is that the first interest of the United States is in its self-maintenance, not in sacrifices to raise foreign standards of living. Normal international, properly controlled competitive trade, according to this theory would automatically develop higher world standards of living, while the gifts of our national substance to other countries only tend to make those nations less self-reliant.

A balanced national tariff program should realize that to the extent international trade results in an accession to the national wealth, it is in the national interest, and should be encouraged. Any form of international trade which would deplete the American economy, by the same token should be rigidly controlled.

The formulation of a scientific tariff policy for the nation is not easy. Tariff legislation in the past has often been a struggle between those sincerely believing that an approach to free trade is to the benefit of the country and those who have sought prohibitive barriers against foreign merchandise. Certainly, between the two there should be some middle ground.

In our present complex economy, the fixing of tariff rates should not be a subject for congressional debate, but for scientific determination by a body of experts. Such a body could conduct investigations, secure the highest economic talent, consider international relations, and by its studies determine a scientifically correct border line below which tariffs should not be reduced, and above which they should not be raised. Industry would be enabled to present its side of the picture.

A flexible scientific tariff rate schedule is the first essential. To set up the machinery for such a program, bills have already been introduced in Congress to establish a new Governmental agency to supplant, or rather expand, the present nonpartisan United States Tariff Commission. This proposal envisages the exclusion of politics and the jockeying of interested groups which wish everything for themselves and are willing to have foreign interests have the rest.

The proposed measures, admittedly introduced as an introduction to a study of the whole problem, include many administrative provisions, too technical to be reviewed at this time.

Accepting the principle of a scientific flexible rate schedule, there should be certain specific changes in present tariff laws, to be made now without waiting for the outcome of any effort to establish a balanced tariff system for this country.

The present countervailing duty provision of the Tariff Act, providing additional duties to meet export subsidies by exporting nations, should be strengthened to make it clear that payments in the nature of tax refunds or distribution out of special funds created by export taxes in terms of sellers markets (as is now being done by Sweden) fall within the category of export grants.

The Geneva agreements permit devaluation of currency not to exceed 20 per cent. This is equivalent to a reduction of duties at the unilateral instance of a foreign country, not as the result of negotiations, reciprocal or otherwise. Rates of duty provided under the Geneva agreements were based on existing currencies. There should be a provision of law to impose additional duties to compensate for currency devaluation by any foreign country.

Merchandise shipped to this country by state trading units and/or foreign cartels should be automatically subject to an antidumping duty to equalize the selling price, plus United States duty, with the American selling price.

Under existing law, foreign producers evade the American provision for computation of duty on the freely offered price in the country of origin by imposing certain restrictions on sales in the country of origin, thus allowing the foreign mills to set their own export price on which the United States must compute duty. This situation, known as the controlled market, should be corrected by provisions to make any merchandise so controlled subject to duty on the basis of American valuation.

The section of the Tariff Act of 1930, providing for domestic manufacturers protests, should be restored to the Tariff Act. This provision was deleted by the original Reciprocal Trade Agreement Act. Under the present procedure, a foreign producer or his American agent has ready access to the United States courts to rectify any error made by Customs officials in the classification or appraisement of imported merchandise. The domestic producer, on the other hand, is denied recourse to the courts to correct any such error which may be to his disadvantage or to the disadvantage of the Government. A court procedure limited to the foreigner and denied the American is not only absurd and illogical, but is in violation of any theory of justice in this or any other country.

The Antidumping Act, now wholly ineffective, should be amended to make the imposition of an antidumping duty

automatic upon the finding by Customs officials that the foreign merchandise is sold at less than the ruling price in the country of its origin. At present injury must be proved to the satisfaction of administrative officials.

There should be provision for special duties to combat discrimination by other nations against our commerce, such as embargoes against our merchandise, or restriction on exports to this country, or any other action which impairs the free international flow of commodities.

This sketchy outline of a balanced tariff program is frankly based on the belief that American industry has a right to exist and to operate on terms which provide a reasonable profit incentive.

Thinking in terms of the paper industry alone, it must be recognized that it cannot be the part of wisdom to bankrupt a domestic industry involving a production valued at four billion dollars a year to develop prosperity abroad. This country cannot do its share toward maintaining world prosperity if any part of its own economic stability is sacrificed.

Review of New Law Suits
Involving the Paper and Paperboard Industry

LEO T. PARKER
Attorney at Law

▶▶▶ RECENTLY a reader wrote as follows: "We have a law suit on our hands. We had an employee injured and he is almost recovered but refuses to work at another job. Can he get compensation from the State Workmen's Compensation Act?"

According to a recent higher court a skilled workman although slightly injured may receive compensation under the State Workmen's Compensation Act based on permanent total disability.

For illustration, in Forner v. American Box Board Company, 29 N. W. (2d) 273, reported January, 1948, the testimony showed facts, as follows: An employee of the American Box Board Company was operating a machine known as the Swift Blanker used in the manufacture and printing of cardboard cartons or boxes. The employee's hand was caught in the printing mechanism of this machine, and was drawn into the machine. As a result the index finger was badly lacerated, and the third finger was broken. The employee was treated by the company doctor for approximately four months. He lost no time as a result of the injury, the hand being bandaged by the doctor, and the employee supervised the operation of the machine on which he had been injured. The employee's hand never healed completely, and he could not perform his duties efficiently, as he was unable to close his left hand; his grasp of the loads that he was required to handle was weak; and in feeding the machine he sometimes dropped material. The employee sued for compensation under the State Workmen's Compensation Act based on total disability.

The testimony showed that the employee's average weekly wage was $70.50 including the bonus which averaged from $5 to $20 depending how fast a man could work.

The Industrial Commission awarded compensation based on total disability. This decision or award was appealed on the grounds that the employee was capable of doing other work around the plant, and he refused to accept other work and therefore should not receive compensation based on total disability. Nevertheless the higher court approved the verdict, saying:

"It is unquestioned that plaintiff's injury arose out of, and was suffered in the course of, his employment. . . . The findings that plaintiff (employee) was a skilled worker is clearly supported by the proofs. . . . The findings of fact made by the compensation commission acting within its powers, shall, in the absence of fraud, be conclusive."

Accidental Injury

Modern higher courts consistently hold that an "accident" is an *event* happening without any human agency. Hence, an employee disabled by an "accident" is entitled to receive compensation, under the State Workmen's Compensation Act, although he was previously physically impaired.

For example, in Clarksburg Paper Company v. Roper, 166 Pac. (2d) 425, it was shown that an employee named Roper was working on a corrugating machine in the plant of the Clarksburg Paper Company. While lifting an iron shaft in order to put it in a roll of paper, he suddenly developed a pain in his chest accompanied by a smothered feeling. From the evidence of the physicians Roper's heart was considerably dilated, and the heart muscles badly damaged.

Although the testimony showed that Roper had a previous severe heart attack which was three years earlier, the higher court awarded compensation based on accidental injuries, saying:

"We think that the evidence set forth justifies the conclusion that Roper's heart gave way while he was engaged in lifting the iron shaft."

Practical Joke

According to a recent higher court, an employee's injury may arise out of and in the course of his employment although he may not be actually working at the time, if he is exposed to risks which are incident to the doing of the employer's work.

For example, in Spencer v. Chesapeake Paperboard Company, 47 Atl. (2d) 385, the testimony showed facts, as follows: An employee named Spencer was hired by the Chesapeake Paperboard Company to do work on a beater machine, where several other men were working. After the beater was filled he would rest, and occasionally doze off in the drying room, where it was warm, before returning to refill it. One night he fell asleep, and was waked up by his pants being on fire. He sustained serious injuries and sued for compensation under the State Workmen's Compensation Act.

During the trial testimony was given showing that *fellow* employees had played a joke on Spencer and set his pants on fire. The higher court awarded Spencer compensation nevertheless, saying:

"If there was no objection on the part of the employer when the em-

ployee rested, during the time when the beater was not being filled, these intervals of rest may be considered incidental to the employment and insufficient to establish a termination of the employment."

For comparison, see Globe Newspaper Company, 131 Atl. 760. Here the testimony showed that it was the custom of the employees to leave the composing room in hot weather to go on the roof for fresh air, and one of the compositors fell off the roof. The Massachusetts Supreme Court held that the evidence warranted that the employee was within the course of his employment, though not actually working at the time.

No Restraint of Trade

According to a recent higher court, a contract is *not* illegal by the terms of which one person or company is given the exclusive right to remove wastepaper, paperboard, and the like from a plant.

For illustration, in Federal Waste Paper Corporation v. Garment Capitol, 61 N. E. (2d) 451, it was shown that the Federal Waste Paper Corporation conducted the business of removing wastepaper and rags from tenants in office buildings, and built up a profitable trade and good will with these tenants. The building owner granted an exclusive right to another paper company to remove the wastepaper accumulated by tenants. The Federal Waste Paper Corporation filed suit but the higher court held that the granting of an exclusive privilege for the removal of waste was neither illegal nor an unreasonable restraint of trade.

Reasonable Settlement

Considerable discussion has arisen from time to time over the legal question: If there is differences in amounts of money involved in reorganization of a paper corporation, what is the important question considered by the court? The answer is: Was the settlement fair and reasonable?

For example, in International Paper Company v. Brickley, 158 Fed. (2d) 212, the suit involved reorganization of a corporation.

The higher court approved settlement for $10,000,000 of a disputed $131,000,000 claim.

The court said that the settlement was fair, reasonable and adequate, and that adequate notice and opportunity to be heard had been given to all persons interested. The court said:

"$10,000,000 does not look so large when it is set up against $131,000,000 by a skillful advocate. The court still think that $10,000,000 is a great deal of money."

Patent Not Allowed

It is well established law that an inventor *cannot* obtain a United States patent on an invention previously patented.

For example, in Application of Crossley, 158 Fed. (2d) 993, the Court of Customs and Patent Appeals considered an application for a patent relating to the production of chemical pulp for the manufacture of white paper from unbarked wood, as twigs or shoots not exceeding one and one-half inches in diameter. The process comprised cooking the wood under superatmospheric pressure in a chemical pulping liquor. After cooking is completed, the pulp is blown from the digester and is then "washed, refined, bleached and otherwise subsequently treated in the same manner as ordinary soda pulp."

The court refused to allow the patent in view of a prior patent to Allen, No. 323,771, August 4, 1885. In this prior patent the inventor taught the making of paper pulp of the limbs and bark of trees previously thought to be useless for pulping, by boiling the wood which had been split and crushed. This was done in water, acid or alkalies, and the material was then crushed, ground, and pulped.

Employee Not Authorized

Considerable discussion has arisen from time to time over the legal question: When is a paper company bound by an employee's contract in business? The answer is: Only when the testimony shows that the company authorized the employee to represent it in the involved business deed.

For example, in Qualline v. Champion Paper & Fibre Company, 206 S. W. (2d) 267, reported February, 1948, the testimony showed facts, as follows: One Qualline sold to the Champion Paper and Fibre Company a tract of land. Later, the company discovered that the tract did not contain nearly as many acres as called for in the deed. The company sued Qualline to recover a substantial part of the purchase price.

During the trial Qualline argued that he was not liable for repayment of any money because the company's officials knew that the tract described as containing far less number of acres because the company's timber walker had informed the official of this fact.

Nevertheless the higher court ordered Champion Paper and Fibre Compay to refund to Qualline the value of the minus acres, saying:

"The evidence fails to show that the witness Strauss (timber walker) was authorized to go upon the land being purchased by appellee (Champion Paper & Fibre Company) for the purpose of determining the acreage. It not being within the scope of his authority to ascertain the acreage in the tract of land involved any notice or knowledge that he might have had pertaining thereto is not as a matter of law imputed to his principal."

Speculative Damages

No higher court will award damages based on mere speculation. Hence, a buyer cannot recover damages from a seller of machinery based on wages paid employees, or loss of profits, unless the buyer *proves* the exact amount of damages.

For illustration, in Jacksonville Paper Company v. Smith & Winchester Manufacturing Company, 32 So. (2d) 326, reported January, 1948, the testimony showed facts, as follows: The Smith and Winchester Manufacturing Company sued the Jacksonville Paper Company on a paper bag machine which the manufacturer had represented would manufacture garment bags at a specified speed. The paper company refused further payments and proved that the manufacturer had agreed to build the machine *on approval*. In other words, if the machine would not satisfactorily make the sixty garment bags per minute guaranteed by the manufacturer, the paper company had the privilege of returning the machine *without* further obligation.

The higher court awarded a verdict and judgment for the manufacturer for the value of the bag machine, $3552.62, plus interest theron in the amount of $1825.52, or a total of $5,378.14. The jury also awarded the paper company $860.00, plus interest thereon in the amount of $327.07, or a total of $1,187.08.

However, this court refused to allow the paper company large damages based on wages paid to its employees attempting to make the machine operate efficiently and "loss of production and speculative profits," because the paper company did not prove that it sustained the amount of damages for which it sued.

Nuisance Liability

According to a recent higher court a legal nuisance may be created by smoke, soot or gases which are cast upon the property of another to his physical discomfort or injury. Hence, a corporation may be liable for maintaining such a nuisance. In cases of this kind the court will decide the amount of damages due the complaining owners of adjacent land.

For example, in Frey v. Queen City Paper Company, 66 N. E. (2d) 252, the owner of a dwelling sued the Queen City Paper Company for damages. The

property owner alleged that the company operated a furnace and heating plant that was fed by a very fine coal which was forced into the furnace by a blower and that small particles of coal, both burned and unburned, went into the outside atmosphere through a smokestack. The property owner also alleged that these "particles of matter or fly ash emanating from the stack" penetrated window ledges and entered the living room and sleeping quarter and the sediment was deposited on the furniture, floors, carpets and linoleum.

The property owner introduced testimony showing that the fly ash was deposited on the ground and in the vegetation, and garden preventing it from growing. The higher court agreed that the property owner was entitled to damages, saying:

"The amount of detriment sustained is not susceptible of exact pecuniary computation. It is for the court to say what sum of money the plaintiff (property owner) should receive in view of the discomfort or annoyance to which he had been subjected."

For comparison, see Dauberman v. Grant, 198 Cal. 586. This court said:

" 'It is not necessary to recover to show actual damage to property caused by the nuisance of smoke and soot, as one is entitled to recover for personal discomfort and annoyance to which he has been thereby subjected' and 'it is a question for the trial court to determine the amount of the compensation which he should receive.' "

OPA Revived

Occasionally a higher court still decides a litigation involving OPA. Better watch these new decisions for future reference.

In Carpenter Paper Company v. Calcasieu Paper Company, Inc., 164 Fed. (2d) 653, reported March, 1948, the Calcasieu Paper Company, Inc. sued the Carpenter Paper Company to recover $33,417.05 due on invoices for paper products sold and delivered in June, 1946.

The Carpenter Paper Company defended the suit on these grounds: First, the Calcasieu Paper Company, Inc., made contract to deliver certain quantities of paper during 1946 at stipulated prices which conformed with OPA prices; Second, that for the first two quarters of 1946 the Calcasieu Paper Company, Inc., had complied with the contract to sell the paper but had refused to make deliveries for the remainder of the year at the prices fixed by the OPA because of temporary termination of OPA on June 30, 1946.

The higher court held that since the OPA had established prices for the whole of the year, the contract for sale of paper remained and was valid.

Federal Compensation

According to a recent higher court any employee whose duties are the *furtherance* of interstate commerce *must* apply for compensation under the Federal Employers' Liability Act, instead of under the State Workmen's Compensation Act.

For example, in Wills v. Terminal R. Ass'n of St. Louis, 205 S. W. (2d) 942, it was shown that an employee was employed to help to install a pipe ventilator through the roof of a building used for making merchandise used in the repair of equipment moving in interstate commerce. The employee fell from the roof of the building to the concrete platform in front of the shop, and sustained severe injuries.

The lower court held that the employee could recover $2,000 compensation under the State Workmen's Compensation Act. The higher court reversed this decision saying that the employee must apply for compensation under the Federal Employers' Liability Act.

Not Dependent

According to a recent higher court one who is *not* dependent on his father for a living cannot recover compensation for death of the father.

For illustration, in Flynn v. Western Board & Paper Company, 27 N. W. (2d) 332, reported very recently, it was shown that one Flynn was 16 years of age. During the preceding year he had attended a public school, and after school he worked at various odd jobs, primarily for the purpose of obtaining spending money. After school was out he obtained employment at the plant of the Sutherland Paper Mills, where he worked 40 hours per week at 64 cents per hour. Flynn remained so employed until his father was killed when working for the Western Board and Paper Company.

Flynn sued to recover compensation under the State Workmen's Compensation Act, for death of his father.

The higher court refused to award compensation saying that Flynn was not dependent on his father for a livelihood at the time of his death.

Fair Labor Standards Act

Recently a very important new point of law involving the Fair Labor Standards Act was decided by a higher court. This court held that the primary purpose of the Fair Labor Standards Act is not to regulate interstate commerce, but to *prohibit* the shipment of goods in interstate commerce *if* they are produced under substandard conditions.

For example, in Atwater v. Gaylord, 184 Pac. (2d) 437, an employee named Atwater sued for $783 for overtime, $783 as liquidated damages, and attorney's fees of $300. Atwater proved that he was employed by Gaylord at $1.50 an hour to make experiments. No goods or merchandise were sold or shipped because of the experiments.

The higher court decided that the Fair Labor Standards Act was *not* applicable to Atwater, and held that Atwater could *not* recover any payment under the Fair Labor Standards Act for overtime. This court said:

"The primary purpose of the Act is to prohibit the shipment of goods in interstate commerce if they are produced under substandard labor conditions. . . . Such being the purpose of the Act, it follows, of course, that it cannot apply in the absence of goods which may be shipped in such commerce. If no goods came into existence which may be shipped, the purpose of the Act wholly fails. . . ."

For comparison, see the case of Culver v. Bell & Loffland, 146 F. (2d) 29, and Gill v. Electro Corporation, 146 S. W. (2d) 352. In these cases employees did a lot of experimentation. During that time the corporation was not, of course, engaged in any production or in the sale of merchandise.

Subsequently the employees sued for compensation under the Fair Labor Standards Act. The court held that they could not recover wage payment specified by this Act.

Duties of Trustee

All courts very consistently agree that a trustee is *legally obligated* to exercise *good faith* which requires him to act with due regard to the interests of beneficiaries. Hence, a trustee *must* comply with provisions of a deed of trust.

For example, in Dinsmoor v. Hill, 187 Pac. (2d) 338, reported February, 1948, the testimony showed facts, as follows: A. Irving Hill and Paul A. Dinsmoor were managing the Lawrence Paper Company and had a verbal understanding and agreement that stock in that company should be owned forever in equal shares by the Irving Hill and Paul A. Dinsmoor families. Suit was filed on the grounds that Irving Hill, after Paul A. Dinsmoor's death, violated the agreement in his fiduciary capacity as a trustee. The testimony showed that Dinsmoor in a deed of trust directed the trustees to "transfer, convey and set over absolutely, to my said children, their heirs and assigns . . . all of the trust estate."

The higher court held that where a deed of trust directs one or more trustees to transfer a trust estate absolutely to the settlor's children, their heirs and assigns, the trustees must transfer the stock composing part of the trust estate to the beneficiaries absolutely.

Paper SKETCHES . . . . . .

JAPAN'S FIRST GLIMPSE OF PAPER SEEMS TO HAVE DATED FROM THE EARLY 600'S, WHEN BUDDHIST MONKS BROUGHT TO THAT COUNTRY MANUSCRIPT SHEETS MADE FROM MULBERRY BARK

IN SOME SECTIONS OF THIS COUNTRY, ABOUT THE 1830'S, CERTAIN PAPERMAKERS ARE SAID TO HAVE SOLD BOOK PAPER AT 9 OR 10 CENTS A POUND— THEN CUT UP THE SAME STOCK AND PASSED IT OFF AS WRITING PAPER FOR TWICE THAT AMOUNT.

IN THE 1700'S PAPERMAKERS SCRAPED UP THE VAT DREGS TO MAKE THE COARSE GRAY OR BROWN PAPER USED TO WRAP REGULAR PAPER FOR SHIPMENT.

A VETERANS ADMINISTRATION SURVEY REVEALS THAT THERE ARE 558 WAR VETERANS IN TRAINING IN THE PAPER INDUSTRY UNDER THE GI BILL — 400 BEING "ON-THE-JOB" TRAINEES, THE REST PURSUING STUDIES IN SCHOOLS.

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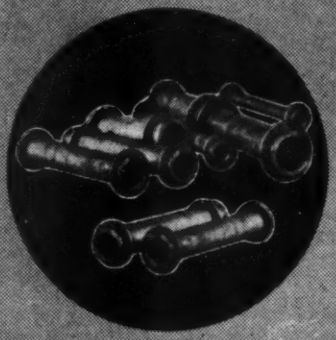
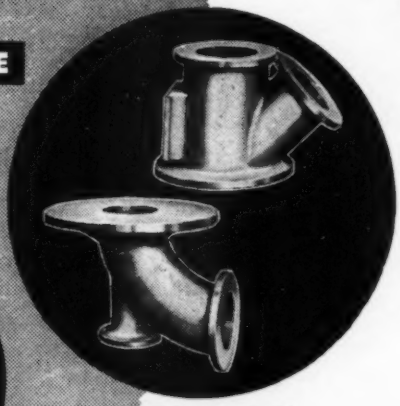
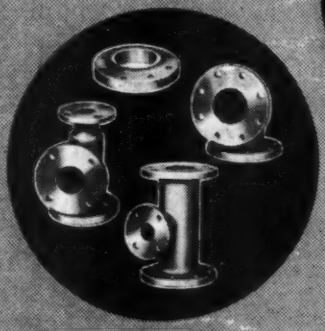


CENTRIFUGAL PIPE



CASTINGS



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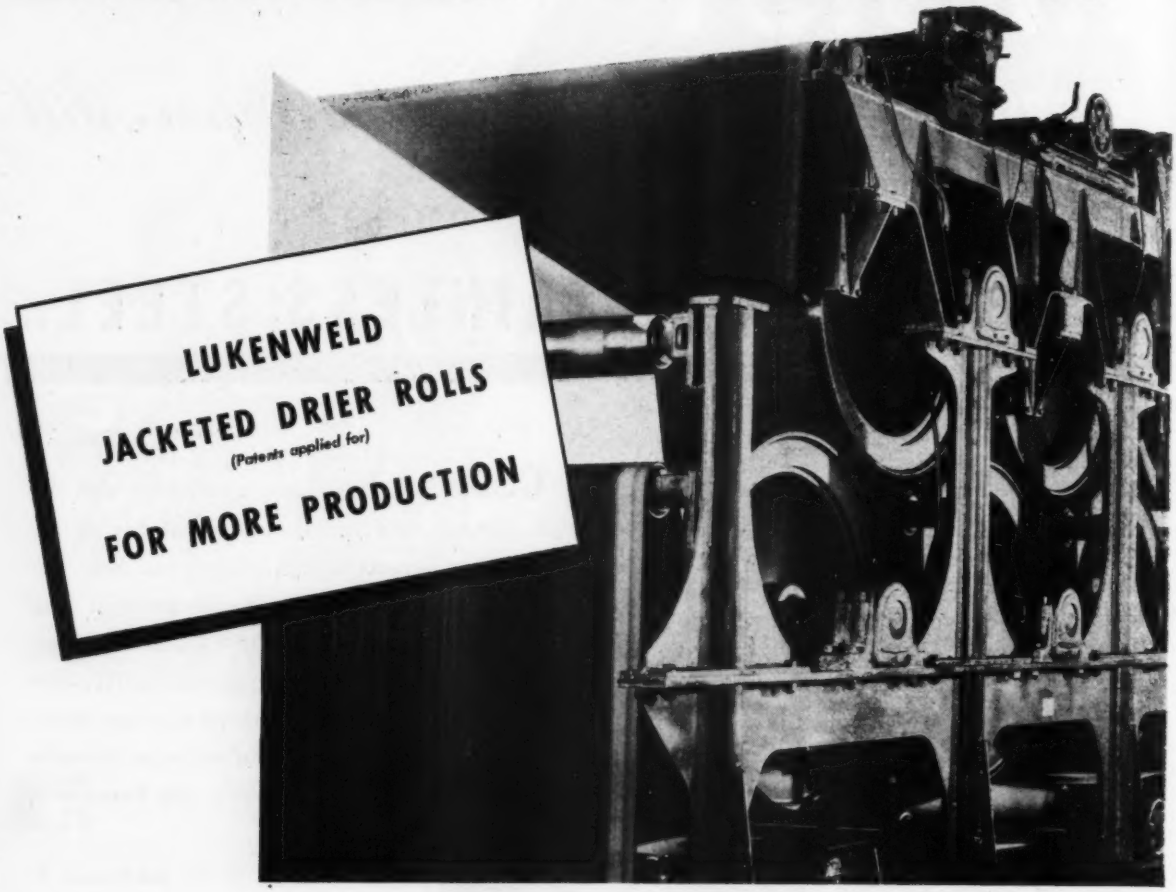

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Canadian Technical Section Holds First Pacific Coast Meeting

▶▶▶ THE SUMMER MEETING of the Technical Section, Canadian Pulp and Paper Association, was held at Vancouver, British Columbia, on September 8, 9, and 10. A special train carried more than one hundred delegates from Eastern Canada, the United States, and Newfoundland. A similar number registered from the Pacific Northwest of the United States and from British Columbia. During their stay in Vancouver, the delegates were guests of the Pacific Coast Branch of the Technical Section.

Hotel Vancouver was the headquarters for this meeting. The sessions were formally opened by F. J. Giffen, chairman of the Technical Section and assistant manager, Newsprint Division, Canadian International Paper Company, Montreal. At this time, G. J. Ostrowski, technical supervisor, Pacific Mills Ltd. and chairman of the Pacific Coast Branch welcomed the delegates to the meetings. Chairman of the first session was C. E. Turner, councilor of the Technical Section and vice president of Building Products Ltd., Montreal. The following program was presented.

John S. Hart, of the Pulp and Paper Research Institute of Canada, presented two reports on the alkaline pulping research program of that organization. The first report was particularly pertinent in view of the locale of the meeting since it was an account of the investigation of the kraft pulping of Douglas fir, a wood peculiar to the Pacific Coast. The report covered the cooking of Douglas fir with 16, 18, and 20 per cent active alkali (as NA_2O) at maximum temperatures of 160, 170 and 180 C. Various sulphidities and cooking times were also employed. Mr. Hart did not endeavor to draw any conclusions but rather provided a great deal of tabulated data for study.

Mr. Hart's second paper dealt with the effect of sulphidity on the cooking of Douglas fir, balsam and spruce. Under the conditions of the experiments the effective alkali was maintained constant as the sulphidity was varied. The effective alkali is defined as all the NaOH plus one half of the Na_2S. The following theory was presented with regard to the behavior of the sulphide in the cooking reaction. From the Na_2S which gives up sulphur in reacting with the lignin, there will be an equivalent additional amount of NaOH made available. In this way there will be about 5 per cent additional NaOH made available due to the reaction of the sulphide with the wood, provided of course that sufficient sulphide is present. Cooks made with low chemical charges show more benefit from high sulphidities than cooks made with higher charges.

Scene at the banquet of Canadian Technical Section on Wednesday evening

R. H. R. Young, manager of manufacture, Pacific Mills Ltd., Vancouver, described the equipment at the Ocean Falls plant of his organization for the manufacture of specialty papers. Mr. Young pointed out that the plant produces groundwood, sulphite, and draft pulps both in an unbleached and bleached condition. From this variety of pulps and with three very flexible specialty paper machines they are manufacturing an extremely wide range of specialty papers such as tissues, toweling, creping, bag, building, wrapping, printing, waxing, fourdrinier boards, fruit wraps, etc. The Ocean Falls products are shipped in palletized loads on car barges to their Vancouver converting plant. Here they are treated, printed and converted to their final form. In addition, Pacific Mills operate in Vancouver a subsidiary company, Canadian Boxes Ltd. At the Canadian Box plant are produced solid fiber container board, single and double wall corrugating board and corrugated boxes. All adhesive used in this plant is a special starch.

S. M. Chapman, Pulp and Paper Research Institute of Canada, gave an explanation and demonstration of the new electronic dirt counter developed at the institute. This instrument was developed to replace the old tedious and inaccurate method of counting dirt specks by hand. A handsheet of the pulp to be tested is placed on a turntable and a scanning arm, in outward appearance resembling the tone arm of a gramophone, is placed over it near the edge. As the turntable rotates, the head of the arm gradually moves to the center; thus the entire surface of the sheet may be inspected. Small lights in the head of the arm are focused on the handsheet; this light is reflected back to a photoelectric cell also located in the head. When the center of the head appears directly over a dirt speck, the amount of light reflected to the photoelectric cell is greatly reduced and this decrease in light is measured and recorded as a dirt speck.

On Wednesday evening there was a reception given by the Western Branch of the Canadian Pulp and Paper Association, following which a banquet was held. Guests at the head table included the executives and councilors of the

Douglas Jones, secretary-engineer of the Canadian Technical Section, addresses one of the sessions

Technical Section as well as executives from all the pulp and paper mills in British Columbia. The chairman, F. J. Giffen, after a few brief remarks, called on F. J. Foley, president of the Powell River Company, to introduce the main speaker, J. A. Young, vice president of Pacific Mills Ltd., and chairman of the Western Branch of the Canadian Pulp and Paper Association. Mr. Young gave a very interesting address on the past history and the present state of development of the pulp and paper industry in British Columbia. The speaker was thanked by John Buss, vice chairman of the Technical Section.

The session on Thursday morning, September 9, was presided over by E. G. Kirby, Price and Pierce Ltd., Montreal, and councilor of the Technical Section. The first paper was by F. W. Guernsey, chief, Division of Wood Utilization, Forest Products Laboratory, Vancouver, B. C. Mr. Guernsey discussed wood waste as a source of pulp on the Pacific coast. He explained that there are two types of waste, (1) logging waste consisting of tops, small trees, high stumps, etc., and (2) sawmill waste such as slabs, edging, trim, and sawdust, etc. Tests indicate that the logging waste represents approximately 20 per cent of the original merchantable volume of the stand. Approximately 60 per cent of this residue was of size and volume to warrant its use for some purpose. The remainder was small broken material unsuitable for any purpose except fuel and definitely uneconomical to remove.

There are three methods of recovering logging waste which otherwise would not be recovered.

1. Prelogging, that is, felling and removing the small material before main operation starts.

2. Relogging, which is the removal of the small material following the main operation.

3. Clean logging, which is the yarding of all possible material during one operation.

There are many factors which govern the particular method to be used. The recovery of this waste material is a matter of economics, and has yet to be fully solved.

In 1947, there were 400 producing sawmills in British Columbia. However, six per cent of these mills cut sixty-five per cent of the total production. On the basis of tests made by the Forest Products Laboratory (Canada) 13.5 per cent of the cubic volume of the log represents sawmill waste. The waste from the larger mills is largely utilized. Lath, broomhandle squares and shingle bands represent a small portion recovered from the waste. Sawdust and hog fuel represent the major portion, great quantities of which are sold as fuel both to industry and to private residences. Approximately 10 per cent of the waste is utilized as pulp chips. This may be sold as slabwood to the pulp mill or chipped and sold as chips.

In the sawmill industry, it is quite simple for the large operations to utilize or sell their waste to advantage. However, the problem at the present time is how the numerous small and moderate sized mills are to dispose of this waste other than as fuel. Some sort of co-operative scheme must be developed to give these smaller units equal advantages.

R. S. Hatch, who recently retired from Weyerhaeuser Timber Company, gave a short informal and "off the record" talk on magnesia base pulping with special reference to the pilot and commercial plants of his company at Longview, Washington.

John Guthrie, superintendent, British Columbia Pulp and Paper Company, Woodfibre, described the design and operation of the chip storage bins in their plants at Woodfibre and Port Alice, British Columbia. These bins were built to replace the old bins and at the same time provide greater storage capacity so as to reduce the oper-

S. M. Chapman demonstrates the electronic dirt counter at one of the meetings

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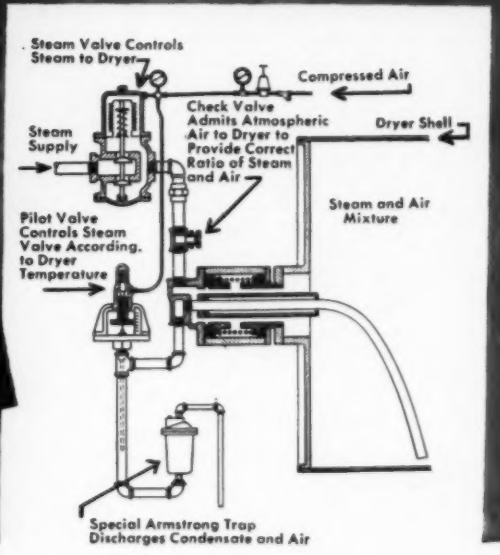
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When steam and air are mixed at atmospheric pressure, the temperature of the mixture will be that corresponding to the partial pressure due to the steam. For example, if the partial pressure of the mixture due to steam is 3.7 lbs. absolute, the temperature will be 150° F. The Armstrong Control diagrammed above automatically controls the ratio of steam and air to maintain accurately the temperature for which it is set. If the temperature of the dryer tends to rise, the pilot valve bleeds compressed air to release pressure on the steam valve bellows, causing it to throttle. A decrease in temperature causes a reverse action. Atmospheric air for the mixture enters through the check valve when the condensing rate of the dryer causes pressure to drop below atmospheric. When temperatures above 212° F are desired, the check valve stays closed, no air enters and steam pressure is raised to the required point.

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ating time of the wood handling and chipping departments. These bins are cylindrical concrete towers similar to grain elevators. The capacity of these silos is 100,000 cubic feet each. The bottom of each bin is in the form of a V instead of the more common cone. This provides additional capacity and is thought to assist in the prevention of plugging of the bins. The angle of the bottom is 45 degrees, since this is slightly greater than the angle of repose of hemlock chips. Chips should be screened before storage since the removal of cards and slivers reduces the tendency for the chips to hang up in the bins. The chips are removed from the bottom of the bins by a Brinkly unloader onto a chain conveyor. It was found that the chips should be put into the bins on the opposite side from which they are unloaded. This causes the formation of a pattern in the stored chips which promotes freedom from bridging or arching when the chips are being withdrawn.

Dr. J. L. McCarthy, University of Washington, presented a paper on the multistage bleaching of kraft pulp. Dr. McCarthy's paper was of a technical nature and is summed up in the following rules which he provided.

1. Composition of a chlorine solution is determined by its pH.

2. Chlorination of lignin takes place most rapidly in acid media.

3. Loss of methoxyl groups from lignin occurs almost simultaneously with addition of chlorine and the reaction is almost molecular.

4. It is probable that chlorination occurs on the phenolic group in the lignin to give quinone types on the lignin.

5. Chlorination and demethoxylation of lignin are very rapid reactions.

6. Although chlorination is completed rapidly, Chlorine consumption continues due to oxidation of both lignin and cellulose.

7. The slow reaction of oxidation of the lignin is very complex and the changes occurring in the lignin are unknown.

8. As a result of chlorination and demethoxylation the lignin is made soluble in alkaline solution. Time for diffusion is important.

9. In single state bleaching, degradation is greatest at *p*H 4 to 5.

10. Less chlorine is used in two-stage bleaching than in one stage provided that there is a wash at *p*H 12 after the first stage.

11. By increasing the temperature in the second stage, degradation is increased but reflectance is improved.

12. As the alkalinity of the second stage increases, the quality improves regardless of the *p*H of the first stage.

E. G. Kirby, chairman of session (at mike) introduces F. W. Guernsey (left) who spoke on utilization of wood waste for pulp

13. As the proportion of chlorine used in the second stage is increased, the cellulose degradation is increased but the brightness is improved.

14. To obtain the best results, two-stage chlorination with washes should be used followed by a final oxidation stage.

The chairman of the sessions on Thursday afternoon was G. A. Franklin, Technical Section Councilor and Technical Director of the E. B. Eddy Company. The following papers were presented:

W. W. Brown, Technical Supervisor, Sorg Pulp Company, Port Mellon, (B.C.), described the horizontal disc chipper in use at his mill. This is the first installation of this equipment known as the Dunbar chipper. In this design the body of the chipper is a cylinder of steel plate, 5 ft in diameter and eight ft high. Steel end-plates are bolted to the top and bottom of the cylinder. The disk is located just below the top and plate and is 58 in in diameter and 6 in thick. The top end-plate carries the spout and the upper shaft bearing. A sloping internal division separates the chipping section from the drive and guides the chips out through a rectangular opening in the side. A smaller opening situated in the body just below the disc level gives additional access for changing knives. The knives are four in number and their placement in the disc is such that their leading edges in each case lie along a radius of the disc. Each knife is 22 in long and is ground with a double bevel, 40 degrees at the edge and 35 degrees farther back.

The chipper is fitted with a 10 in square spout having an angle of 38 degrees to the face of the disc. The chip breakers consist of several steel discs 47 in in diameter situated on the shaft below the main disc. From bolts on these plates are swung four sets of fingers. These fingers in passing mesh with four sets of fingers let into blocks in the cylinder body. The projection of the outer fingers into the chipper can be adjusted at will. The motor is 200 hp, 1165 rpm, and the drive is 13, 1 in vee belts. A speed reduction of 2 is obtained with the drive. Capacity of the chipper is roughly equivalent to 25 cords per hour and at this rate the motor is 20 per cent overloaded.

Provision has been made in the design so that up to three spouts may be operated on this chipper. Chip quality is good and no chip screens are required after this chipper.

H. B. Urquhart, assistant to the resident manager, Powell River Company, Powell River, B. C., read a paper outlining their experience with vibration problems on high speed newsprint machines. By the use of a resonator box they were able to study the type of vibrations causing their troubles (waves on the wire of high speed newsprint machine) and locate a vibrating source with a similar frequency. The vibration was eliminated, the waves disappeared and paper quality was improved.

Dr. S. G. Mason, Pulp and Paper Research Institute of Canada, described his research work on the flocculating or clotting of pulp fibers in suspension and presented some interesting data and ideas. Dr. Mason's work is of practical interest in that the clotting of pulp fibers in water suspension is a problem in paper and board formation.

A dance was held on the Panorama Roof of the Hotel Vancouver on Thursday evening under the sponsorship of

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the Pacific Coast Branch of the Technical Section.

The final session was held on Friday morning under the chairmanship of John Buss, Councilor of the Technical Section, when the following papers were heard.

F. H. Ludwig, instrument engineer, Bloedel, Steward and Welch Ltd., Pulp Division, Port Alberni, B. C., presented a paper entitled "Instrumentation of a Modern Kraft Mill." Mr. Ludwig described all the instruments used in his plant, beginning with the chips entering the digester building on through the process until the pulp leaves the Flakt dryer. Mr. Ludwig referred to each instrument, its type and location and told of any difficulties occurring with its operation. He illustrated his paper with a considerable number of charts from the instruments.

E. T. Buchanan, assistant chief engineer, Consolidated Paper Corporation, Grand Mere, P. Q., in his paper "Deflection Tests—Suction and Top Press Rolls," outlined a method of determining the amount of sag of press rolls by measuring the deflection with reference to a steel beam firmly fixed above the press rolls. These measurements gave deflection changes which could be compared with the figures as obtained from the formulae customarily used to give the deflection of rolls for the various loading conditions.

John Ashby, mill manager, Westminster Paper Company, New Westminster, B. C., gave an informal resume of recent improvements at his plant. Since the delegates were to visit the Westminster Paper Company mill that afternoon, Mr. Ashby did not go into details but briefly referred to the new tissue machine, steam plant, groundwood mill and the new groundwood bleaching system now being installed.

Friday noon the members and friends met for a final gathering at a luncheon. The guest speaker at this function was Prof. F. H. Soward, director of International Studies, University of British Columbia. Professor Soward spoke on Canada and the Marshall Plan.

In the afternoon, golf enthusiasts met at the Point Grey Golf Club for a tournament. Others visited the mills and converting plants in the vicinity.

This was the first time that the Technical Section had held its summer meeting in the Pacific Coast area and for the majority of those attending from the East this was their first visit to British Columbia. Therefore, all the easterners made quite extensive tours of the various pulp and paper establishments in the province prior to returning home.

TAPPI Mechanical Pulping Conference

▶▶▶ SPONSORED JOINTLY by the Technical Association of the Pulp and Paper Industry and the Technical Section of the Canadian Pulp and Paper Industry, a three-day Mechanical Pulping Conference was held September 27-29 at Poland Spring House, Poland Spring, Maine, with a registered attendance of some 200 technical men from both Canada and the United States. This was the first such meeting to be devoted exclusively to manufacture of groundwood and the problems involved therein.

As pointed out by W. S. Gillespie, president of TAPPI, this unique conference was the outcome of plans fostered by the late TAPPI president Worthen E. Brawn, of the Pejepscot Paper Company, Brunswick, Maine, but its success resulted from the Mechanical Pulping Conference Committee headed by John Parsons, Hollingsworth & Whitney Company, Waterville, Maine, and on the high quality of the papers presented. Truly a meeting of international scope, the program comprised papers by Canadian and American authors to cover the subject from the large newsprint mills of Canada to the small specialty mills in this country.

The conference was divided into six sessions covering the following: Wood Preparation; Groundwood Manufacture; Screening, Thickening, and Refining; Bleaching; Slime Control; and Hardwood Pulping.

Much of the material presented in the papers consisted of reviews of accepted practices in the different segments of this industry. More important, however, were the discussions that grew out of the basic material presented in the papers.

Wood Session

Starting out the program was the Wood Session under the chairmanship of R. M. Drummond, International Paper Co. The first paper entitled "Wood, Its Preparation and Measurement," prepared by J. B. Jones of the Ontario Paper Company, Ltd., was, in the absence of Mr. Jones, read by W. W. Holland, Quebec North Shore Paper Company. Common methods of wood preparation were described and procedures for handling both barked and unbarked wood were illustrated. Similarly, various pieces of wood barking equipment in common use were described and illustrated. Various methods of wood measurement were discussed; the volumetric system in use at this company's plant at Thorold was described in some detail. The various factors involved in the purchasing and in the correlation of pulp yields, wood inventories, and woods operations were emphasized. In particular, wood density was shown to be a useful measurement in correlating wood purchasing and pulp yields.

Manufacture of Groundwood

On Monday afternoon, G. F. Witty, Canada Paper Company, presided over the Groundwood Manufacturing Session. The first paper in this group was given by W. W. Holland who reviewed the manufacturing of groundwood for use in the newsprint industry that is so prominent in Canadian operations. In highlighting the large-scale groundwood operations, Mr. Holland's paper served to point up the main characteristics of this type of operation.

The second paper in this group was given by Robert Magruder, of the St. Regis Paper Company. He discussed the use of the Roberts grinder for Manufacturing different grades of Groundwood. He gave a short description and by means of illustrations showed the main construction features of the Roberts grinder. Described were a series of tests run on commercially operating Roberts grinders for determining the operational characteristics. Such factors as the effect of stone surface age, power input, grinding temperature, power consumption, and fiber classification were covered.

In contrast to the first two papers of this session, was the one presented by C. Ives Gehring, of the Oswego Falls Corporation, wherein was discussed the manufacture of different grades of groundwood with three-pocket grinders. Here, the manufacture of groundwood for use in the production of paper and paperboard, varying from facial, toilet, and wrapping tissue to heavyweight cylinder board specialties, was described. Here,

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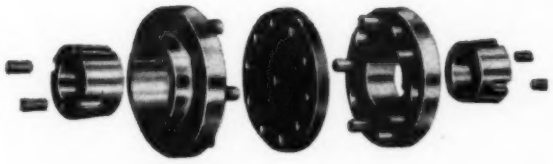

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one system is used for grinding all grades of pulp. Quality and uniformity are based on the use of a group of relatively small grinders, all standardized in stone character, type of burr, and temperature. Slight changes in pressure and a well-controlled burring cycle help produce a uniform pulp despite changes in wood character. An important factor in this operation is selective screening, wherein fibers of different sizes are separated. Subsequent blending of the primary grades produces a pulp of the required characteristics for use in the particular paper to be made.

One of the most important considerations in the manufacture of groundwood and its subsequent use on paper machines is the application of instrumentation and automatic control to the process. The paper covering the "Instrumentation of the Groundwood Pulping Process," prepared by J. N. Franklin,. Bowater's Newfoundland Pulp and Paper Mills, Ltd., was, in Mr. Franklin's absence, read by G. H. Clark, of Price Bros. and Company, Ltd. This paper described the present practice in instrumentation of this process and outlined an ideal process wherein each step of the process is completely automatically controlled.

Stock Preparation

Starting Tuesday morning was the session on Stock Preparation which included papers on screening, thickening, and refining. W. W. Holland, Quebec North Shore Paper Company, was chairman of this session. The first paper was entitled "Screening and Thickening Operations and White Water Systems," and was read by J. Edwards, Price Bros. and Company, Ltd. Mr. Edwards discussed the economies brought about by installing Cowan screens in the groundwood system.

A paper covering the refining of rejects was given by C. T. Robinson, Consolidated Paper Corporation, Ltd. This paper presented information and data on various types of reject refining systems—it was merely a presentation of data rather than an interpretation of the results obtained from the different systems.

The third paper of this group covered the subject of "Grinding Room Operation and Its Relation to Paper Quality and Paper Products," prepared by R. P. Wetmore and L. W. Dunphy, Anglo - Newfoundland Development Company, Ltd.

Bleaching Session

One of the important advances of the past decade has been the bleaching of groundwood pulp. F. C. Goodwill, of the St. Regis Paper Company, presided over a session in which different types of groundwood bleaching processes were covered in some detail. The first paper of this group was devoted to "Zinc Hydrosulphite Treatment of Groundwood," by I. H. Andrews, Powell River Company, Ltd. This paper discussed the brightening of groundwood by zinc hydrosulphite and described the process in use at Powell River, which process employs zinc hydrosulphite for a treatment, governed by the temperature and amount of treatment desired. This paper included a discussion of the manufacture of zinc hydrosulphite and described the high capacity groundwood washer used in this process.

"Bleaching groundwood Pulps with Hypochlorite" was the title of a paper by Ralph M. Kingsbury, Earle S. Lewis, and Forrest A. Simmonds, of the Forest Products Laboratory. The possibility of using calcium hypochlorite for bleaching groundwood pulps has been studied at some length by the Forest Products Laboratory. From these studies, it appears that favorable results with hypochlorite depend on controlling the reaction rate by suitable adjustment of different factors such as temperature, density, and alkalinity. Influence of bleaching on shrinkage, freeness and strength was described and illustrated.

One of the most widely used processes for bleaching groundwood is based on the use of peroxide. This process is now in commercial operation in a number of mills and it has been shown that groundwood bleached in this manner can be used to advantage in the manufacture of a wide range of papers and specialties. With groundwood at a higher brightness level it is now possible to include a substantial percentage of this type of pulp in a paper furnish and still maintain a satisfactory brightness together with good formation, bulk, opacity and printing qualities. This discussion prepared by J. S. Reichert and R. H. Pete, of the E. I. du Pont de Nemours and Company, Inc., presented a summary of developments of the peroxide process for bleaching groundwood. It covered such factors as the chemistry of peroxide bleaching, equipment for groundwood bleaching, operation of the bleaching process, variables in the bleaching process, and applications of bleached groundwood pulp.

The fourth paper in this group was entitled "The Nature of the Color Changes in Groundwood," by J. A. Van den Akker, H. F. Lewis, G. W. Jones, and M. A. Buchanan of the Institute of Paper Chemistry. Here is discussed the color of groundwood, action of light on color and the nature of the color change resulting from sodium peroxide bleaching. It was found that the influence of groundwood content in mixed furnishes both on the color and color changes is large even for a small groundwood content. The *p*H of the furnish is important as are moisture content and temperature from the standpoint of preventing discoloration.

Slime Control

The Wednesday morning meeting was devoted to Slime Control in the groundwood systems. Chairman of this session was A. E. Bachmann, of the Missisquoi Corporation. Causes and effects of slime development in groundwood mills were discussed in a paper by R. B. Martin, and J. Chamberlin, of the Wallace and Tiernan Company, Inc. Common sources of slime infection were reviewed. The authors pointed out that the particular design and physical arrangement of the groundwood system was important in the effort to minimize slime growth. Use of various bactericidal and fungicidal treatments were considered.

The second paper given at this session was by S. J. Buckman, Buckman Laboratories, Inc.; it was entitled "Microorganism Control in Mechanical Pulp and Its Relation to Paper Manufacture." Mr. Buckman emphasized the growth of slime in paper machine operations rather than the loss of fiber due to the growth of microorganisms. While the loss of fiber is serious, major losses result from the growth of slime. The use of chemical compounds such as phenylmercuric acetate was described.

Session on Hardwoods

Final technical session of the program on the subject of Hardwoods, under the chairmanship of G. E. Shipman, of the Donnacona Paper Company, Ltd., consisted of two papers. The first of these resulted from work at the Forest Products Laboratory and was prepared by A. Hyttinen and E. R. Schafer. In this paper was discussed the grinding characteristics of a number of different woods such as cottonwood, yellow poplar, black tupelo, and others. Quality of paper made from furnishes, including groundwood pulp from different species were compared.

The final paper of the program given by Henry J. Perry, Frederic C. Clark Associates, was titled "Trends in Mechanical Pulping Operations." Mr. Perry outlined and summarized the present status of various factors, both economic and technological that make up the structure of this whole branch of the pulp and paper industry. He covered such points as wood supply, operating costs, replacement costs, and obsolescence, present status of equipment and operations taken from the

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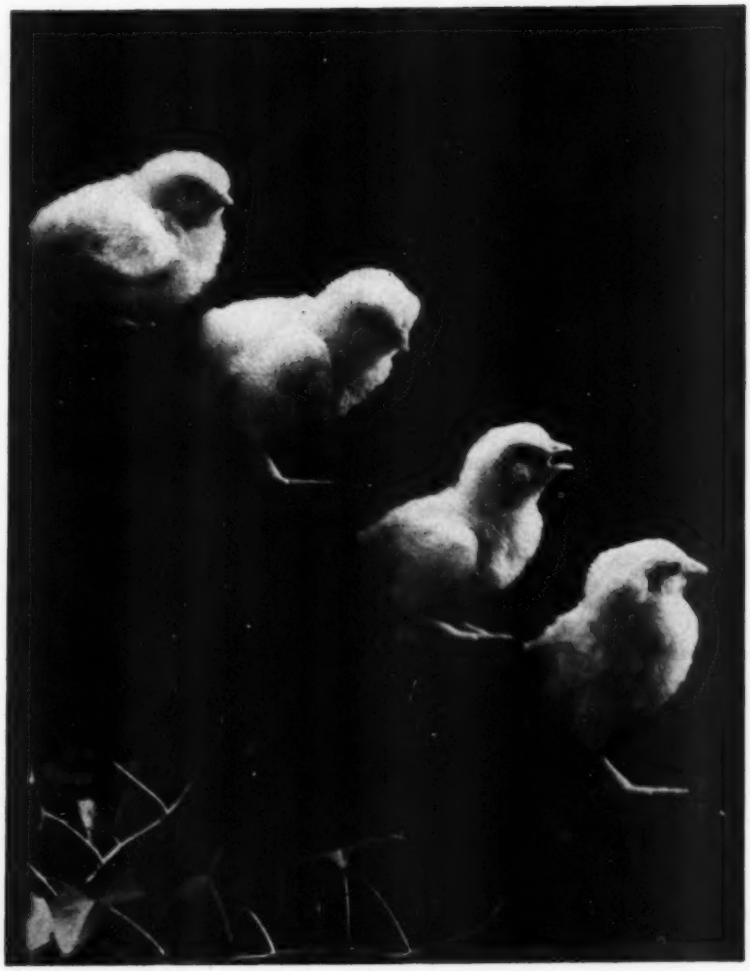

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TAPPI survey. Mr. Perry outlined some of the paths that must be considered and that must be studied in order to assure the continued progress in the manufacture of groundwood pulp.

From the standpoint of entertainment, one of the highlights of the meeting was a program put on by the Maine-New Hampshire Section of TAPPI. Outstanding was the performance of the S. D. Warren Company Glee Club. Included in this program was a talk by John Gould. The dinner program on the following evening featured a talk by R. E. Canfield, secretary-treasurer, Groundwood Paper Manufacturers Association.

Conference on Bark Utilization

▶▶▶ PROGRESS IN the field of bark utilization was the subject of an all-day symposium at the Massachusetts Institute of Technology, Cambridge, Massachusetts, on September 17, 1948. The meeting was sponsored by the Northeastern Wood Utilization Council and conducted by E. L. Heermance, secretary, and R. S. Aries, director of the Council. This conference consisted of papers describing the chemistry and utilization of barks by researchers from both Canada and the United States.

While many phases of the subject were covered, it was pointed out by Arthur Pollak, consultant, New York City, that although a number of useful products are derived from bark, the over-all problem of bark utilization had not been solved. To date, research on the chemistry of bark has not produced any uses whose economic return is greater than when bark is used for fuel. Even so, the problem of dewatering bark is often sufficiently costly to prevent its use for this purpose. Dr. Pollak presented a summary of a paper prepared by Erwin Kurth, Oregon State College on "The Chemistry of Bark."

"Availability of Bark" was covered in a survey reported by F. C. Simmons, Northeastern Forest Experiment Station, Upper Darby, Pennsylvania, who read a paper prepared by J. C. Rettie, of the same organization. Two sources of bark that seem most feasible as a source of supply for bark consuming industries are (1) bark removed from pulpwood, (2) bark from sawmill waste. However, the author concluded that some difficult problems must be overcome before bark can be used as an industrial raw material. Economically, bark is not yet an attractive source of raw material for large volume industrial uses.

A paper entitled "Research on Bark at McGill University," was presented by Victor Harwood who co-authored the paper with Clifford D. Purves, also of McGill. This paper discussed extraction with solvents of such materials as resin, waxes, and esters. All work here was done on a laboratory scale.

One of the most interesting points of the program was the discussion by William J. Van Beckum on the bark utilization program of the Weyerhaeuser Timber Company, Longview, Washington. This company is now processing and marketing some 20 tons per day of Douglas fir bark. Three basic forms of material are separated: (1) cork, (2) fiber, (3) amorphous powder. Bark is shredded, ground, dried and screened to separate these fractions. These are marketed as such together with two additional products blended from the three basic materials mentioned above. These five products known as Silvacon were introduced in 1947 and find such uses as soil conditioning agents, an ingredient in plastic compositions, insecticide dusts, etc.

Considerable work has been done on structural boards from bark according to H. Schwarz and L. P. Clermont, of the Forest Products Laboratories of Canada. Boards were made experimentally from a number of species of bark. Results on high density boards were not promising, but low density boards appeared to be strong enough for many applications.

Two papers were presented on tannin. One of these by F. O. Flaherty, of the Tanners Research Council, was read by M. Gialla, of the A. C. Lawrence Leather Company and discussed the tannin shortage in this country. A second paper by Jerome Rogers, Eastern Regional Research Laboratory, described the various sources of tannin that might eventually take the place of chestnut which is becoming increasingly scarce. Several species of bark including hemlock, fir, oak, maple, etc. can supply our tannin needs if suitable manufacturing methods can be developed.

Uses of bark products as fertilizers in soil building agents was discussed by Benjamin Wolf, of Seabrook Farms, New Jersey. A number of experiments have been conducted on the use of bark for this purpose and these tests show that under certain conditions, bark can be used quite successfully. However, there are certain disadvantages, one of which is that the bark is too costly for this purpose. Other disadvantages are that it contains too little nitrogen; its application requires the use of lime to counteract the acidity, and large quantities are needed to have an appreciable affect on the soil. It was suggested that some of these disadvantages might be overcome by adding nitrogen and other chemicals to the bark, producing a better, more useful fertilizing material.

A process for using bark in the deinking of wastepaper was described by R. S. Aries.

Methods and cost of drying bark were discussed by a number of individuals and by representatives of various companies that make bark-drying equipment. Companies whose representatives entered the discussion were: Nekoosa Manufacturing Company, Nekoosa, Wisconsin; George L. Squier Company, Buffalo, New York; Stacom Industries, Incorporated, Long Island City, New York, and others.

In concluding the program, E. L. Heermance, secretary of the Northeastern Wood Utilization Council, outlined a program for research on bark problems.

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MEMBERS OF THE CANADIAN PULP AND PAPER INDUSTRY HOLD ONE-DAY CONFERENCE

Highlighting the discussion at a one-day conference of members of the Maritime and Newfoundland branch of the technical section of the Canadian Pulp and Paper Industry, were production problems common to all mills in the area. The meetings, held at the Admiral Beatty Hotel, Saint John, were presided over by J. Wing, manager of the Gaspe Sulphite Company and chairman of the Maritime-Newfoundland branch.

A feature of the conference was a visit to the mill of the Saint John Sulphite Ltd., at Fairville, N. B., where the delegates were conducted through the plant and shown the various operations carried out. Golf matches were arranged for the delegates, at the Westfield Golf and Country Club. The conference came to a close with a dinner at the hotel.

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LEFT—L. E. Randecker (Hammermill Paper Co.) at microphone spoke before the season's first meeting of the Michigan Division of the Superintendents Association. Seated (L to R) are: C. B. Smith, Frank Hayes, H. B. Johnston, and Harry E. Weston. . . . RIGHT—W. H. Astle (Michigan Paper Co.), past chairman of the Michigan Division of the Superintendents Association, receives from Glen Sutton (Sutherland Paper Co.), Fourth Vice President of the National Association, Recognition Award Certificate. H. B. Johnston, Michigan Division Chairman, looks on

FIRST MEETING OF SEASON HELD BY MICHIGAN DIV. OF SUPERINTENDENTS ASS'N

The first meeting of the current season of the Michigan Division of The American Pulp and Paper Mill Superintendents Association was held at the Hotel Harris, Kalamazoo, Michigan, September 16, 1948. Seventy-seven members and Affiliates attended. Herbert Johnston, of Allied Paper Mills, newly-elected chairman of the Division, presided.

Highlighting the program was a paper on "The Controlled-Flow Victory Beater," by L. E. Randecker, conservation co-ordinator of the Hammermill Paper Company, Erie, Pennsylvania. Using slides to illustrate his paper, Mr. Randecker described the beater in detail reporting on various tests which have been made to determine its efficiency. Results of these tests were highly favorable.

A question and answer discussion revealed that several of the beaters already were installed and operating and that additional units were on order. Numerous technical questions raised by the audience were answered by Mr. Randecker, Frank Hayes, and Sales Manager C. Smith, Kalamazoo representative of Noble & Wood Machine Company. Noble & Wood Machine Company, Hoosick Falls, New York, manufacturer of the Controlled-Flow Victory Beater, sponsored Mr. Randecker's presentation as well as the social hour immediately preceding it.

Earlier in the program Harry E. Weston, associate secretary-treasurer of the National Association, presented an innovation in entertainment. He selected three members of the audience as contestants to identify portraits of five men who, in the past, contributed to the building up of the pulp and paper industry. These portraits were shown individually on the screen. Biographies, shaped up in radio quiz program style, were read during the showing by Mr. Weston as an aid to the contestants in identifying the pictures. None of the three contestants was able to identify the portraits but three of the five were identified by members of the audience. The stunt, designated by Mr. Weston as "Names to Remember," proved to be both instructive and humorous and will no doubt be tried in other divisional meetings of the Association.

Past chairman of the Michigan Division, W. H. Astle, Michigan Paper Company, was presented with a Recognition Award Certificate by Glen Sutton of Sutherland Paper Company and fourth vice-president of the National Association. Olin W. Callighan, secretary-treasurer of the Division, submitted his report showing that the Division is in a satisfactory financial condition. Mr. Callighan also introduced Dr. A. H. Nadelman, Head of the newly-instituted Department of Pulp and Paper at Western Michigan College of Education in Kalamazoo. Dr. Nadelman stated that registrations for the new course had been highly gratifying. He also expressed the hope of visiting all of the paper mills in the area and to become well acquainted in them.

NW DIV. SUPERINTENDENTS ASS'N MEETS AT MERRILL

The fall convention of the Northwestern Division of the American Pulp and Paper Mill Superintendents Association was held at the Badger Hotel, Merrill, Wisconsin, on September 24 with a registration of about 150.

The program included a joint luncheon, a professional meeting during the afternoon, and a joint dinner party in the evening. The morning of September 25 was given over to a business meeting. There was a men's luncheon, a golf tournament during the afternoon, and a dinner dance in the evening.

The following officers were elected for the ensuing year:

Chairman—Frank X. Kreiling, Thilmany Pulp & Paper Co.

First Vice Chairman—Laurin Sabatke, Marathon Corp.

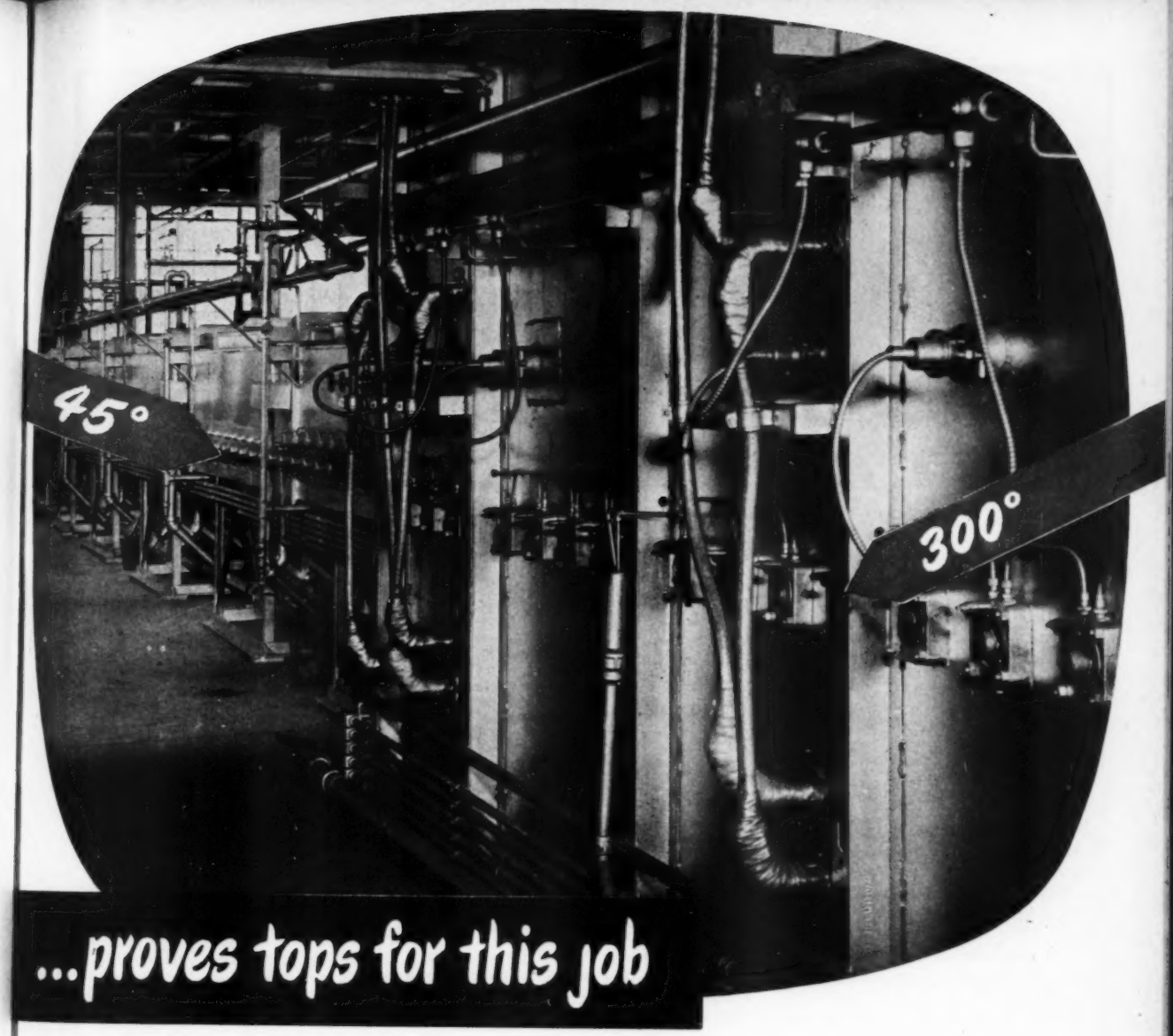
Second Vice Chairman — Mace V. Harris, The Northwest Paper Co.

Trustees elected for the divisional group were: Grover Keeth, Marathon Corp., for one year; Charles H. Reese, Nekoosa-Edwards Paper Co., for two years; Edward E. Dendooven, Northern Paper Mills, for three years.

Speaker at the luncheon on the first day was M. N. Taylor, executive director, Trees for Tomorrow, Inc. In his address on the subject "Future Pulpwood for Wisconsin Mills," Mr. Taylor reviewed the history of Trees for Tomorrow, Inc., highlighted its long-range program, and spoke of some of its accomplishments to date. His narration was accompanied by the showing of an interesting film.

The joint luncheon meeting was concluded with the showing of a film picturing the research activities of Hercules Powder Company's laboratories. This picture dramatized research projects developed from the problem stage to the solution stage and finally to the result.

At the professional meeting during the afternoon, two papers were presented. There also was an open forum. The first of the papers on the subject "The Role of Groundwater in Power



...proves tops for this job

A sizzling 300°F. to a chilly 45°F.—that's the temperature range of the various conveyor bearings on the brazing oven and cooler illustrated above. Yet Stanobar Grease is used on all 350 bearings in the unit.

This grease has a high melting point, so that on the hot bearings it resists thinning out and does not separate. At the same time Stanobar maintains a smooth, workable consistency on the cool bearings. As a result, all bearings are protected against wear, dirt and moisture at all times.

Stanobar Grease can reduce lubricating cost on the many anti-friction bearings in motors and machines in your plant. Two grades are available, for application either by grease gun or through central lubricating systems. Ask for the services of the Standard Oil Lubrication Engineer in your midwest locality. Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANOBAR GREASE

STANDARD OIL COMPANY (INDIANA) STANDARD

LEFT—M. N. Taylor, executive director, Trees for Tomorrow, Inc., delivering address on Future Pulpwood for Wisconsin Mills at meeting of Northwestern Division of the Superintendents Association. Seated at his right is S. E. Ekman (Rhinelander Paper Co.), retiring chairman of the NW Division. At his left, Harry E. Weston, associate secretary-treasurer of the national Superintendents Association . . . RIGHT—Officers of Trees for Tomorrow, Inc. L to R: M. N. Taylor, executive director; D. B. Smith (Ward Paper Co.), secretary-treasurer, and C. G. MacLaren (National Container Corp. of Wis.), vice president

Production," was given by M. W. Kyler, manager of Wisconsin Valley Improvement Company. R. A. Nugent, Nekoosa-Edwards Paper Company, presented the second paper. Using large-scale drawings, charts, etc., as visual aids in his presentation, he described the new multi-stage bleaching plant that is in use at Nekoosa for the bleaching of sulphate pulp.

The open forum was presided over by Mace V. Harris. The discussion was concentrated largely on two subjects: (1) Comment on groundwater stimulated by the paper given by Mr. Kyler earlier in the meeting; (2) the shrinkage of pulpwood, specifically rough balsam, in storage. There were related experiences. A test run at one mill showed a shrinkage of 7 per cent by volume from spring through the summer season. Another participant mentioned that a test run is under way in his mill at the present time to determine the shrinkage factor.

At the joint dinner party on September 24, the guests were entertained by a professional magician. Also at this party, Harry E. Weston, associate secretary-treasurer of the national organization, presented a sketch accompanied by portrait slides on "Names to Remember." This historical novelty is based on careers of men who have contributed to the development of the pulp and paper industry. Three contestants from among the guests vied with one another. The winning contestant was Harold Norseen, of Valley Iron Works Company, who identified three of the five portraits shown. Another contestant identified the other two portraits.

The recreational program included a sightseeing tour for the ladies, followed by a luncheon; and a bowling party for both men and women. Those present at the meeting were invited to visit both the Ward Paper Company at Merrill, and the Rhinelander Paper Company, at Rhinelander.

Fred C. Damp, Ward Paper Company, was convention chairman; Laurin Sabatke, Marathon Corporation, was general chairman of the professional meeting, and S. E. Ekman, Rhinelander Paper Company, retiring chairman, presided at the business meeting.

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GEORGIA OPENS ITS FOREST FIRE PREVENTION CAMPAIGN

The forest fire prevention program in Georgia will be boosted this fall and winter by the distribution of 20,000 stick-pin buttons to children. The buttons are about the size of a penny and contain the message: "I'm Helping Prevent Forest Fires." The supply of buttons is being issued by the Georgia Department of Forestry in connection with the Co-operative Forest Fire Prevention Campaign.

Also connected with this project, were the refresher training courses held in September for the rangers from counties having fire protection units. Topics discussed included duties of rangers, educational activities, new equipment possibilities and uses of equipment, and law enforcement.

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▶▶▶ PULPWOOD DEALERS from Georgia, South Carolina, Florida and Alabama organized the Southern Pulpwood Dealers Conservation Association, late this summer. Its purpose is the promotion of better forestry practices in co-operation with mills. The officers include B. E. Pelham, of Ellaville, president; P. D. Breckenridge, of Columbus, vice president; and James E. Lawton of Soperton, secretary-treasurer.

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COMING EVENTS

Oct. 25-28 — TAPPI (National) fall meeting, Third Engineering Conference, Buffalo, N.Y., Statler Hotel and the auditorium of Westinghouse Electric Co.

Oct. 28-30—Meeting of National Paper Trade Association, Hotel Stevens, Chicago, Ill.

Oct. 29—Fall meeting of the Waxed Paper Industry, at the Congress Hotel, Chicago.

Oct. 30—Connecticut Valley Division of the Superintendents Association will hold its Fall and Annual Meeting at the Sheraton Hotel, Springfield, Mass.

Nov. 15-16—Fibrous Agricultural Residues Committee of TAPPI will meet at the Northern Regional Research Laboratory, Peoria, Ill.

Nov. 16—TAPPI (Pacific Section) will meet in Camas, Wash.

Dec. 3—Pacific Coast Division Superintendents Association will meet at the New Washington Hotel, Seattle, Wash.

Dec. 16-18—Society of American Foresters will hold annual meeting at the Statler Hotel, Boston, Mass.

Jan. 11—TAPPI (Pacific Section) will meet in Seattle, Wash.

Feb. 20-25—Annual meeting of the American Paper and Pulp Association and paper groups, at the Waldorf-Astoria Hotel, New York City.

Feb. 20-25—Annual meeting of the Technical Association of the Pulp and Paper Industry, at the Commodore Hotel, New York City.

Apr. 8—TAPPI (Pacific Section) will meet in Longview, Wash.

STATED MEETINGS

Chicago Professional Paper Group meets the third Monday of each month at the Chicago Bar Association, Chicago, Ill. (except July and August).

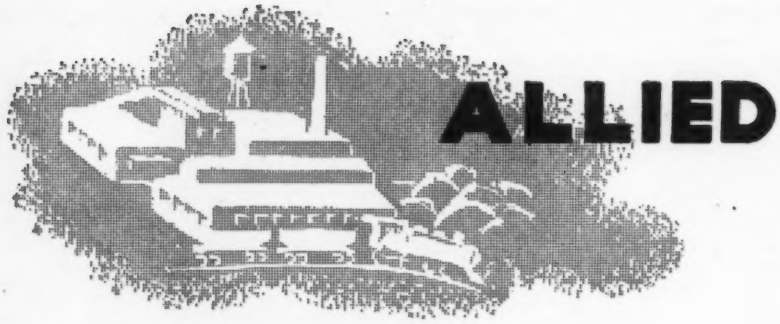
WHEN PAPERMAKING BEGAN TO EMERGE FROM THE *Individual* EFFORT

In the early days paper was made in a workshop, not a factory. The early paper maker produced paper sheet by sheet. As the making of paper emerged from the individual effort, machines began to take the place of the individual. The art of paper making became an industry . . . an industry that today produces tons of paper easier than the early paper maker produced sheets. The individual used felts to remove water from the sheets, and as machines replaced hand methods, felts too kept pace with development of the industry. Since 1890 Appleton felts have met all requirements of paper mill production—that's why today they are preferred by mills everywhere.

This is one of a series depicting early history of paper making.

APPLETON WOOLEN MILLS

APPLETON
WISCONSIN



HAMILTON-THOMAS CORP. FORMED AS OPERATING CO.

Formation of the Hamilton-Thomas Corporation, Hamilton, Ohio to operate Economy Pumps, Inc., Klipfel Manufacturing Company, and Liberty Planers, Inc., manufacturing divisions of Hamilton-Thomas, is announced by officers of the newly formed corporation.

Officers of the corporation are Richard Thomas, president; L. G. Thomas, executive vice president; H. R. Ryan, vice president; R. H. Thomas, Jr., vice president; E. T. Drinkuth, secretary; and L. V. Thomas, treasurer.

Economy Pumps, Inc., has manufactured centrifugal, axial flow and mixed flow type pumps for the past 34 years. Liberty Planers, Inc., which succeeded the Liberty Machine Tool Company, in Hamilton since 1918, is widely known for the manufacture of machine tools. Klipfel Manufacturing Company, which became a part of the Hamilton - Thomas Corporation in 1946, has produced valves of many types since 1904.

Creation of the Hamilton-Thomas Corporation as the operating organization is part of a widespread expansion program in the manufacture and distribution of products of each division.

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NEW CONSULTING BUSINESS ANNOUNCED BY J. CALKIN

A new consulting business in the pulp and paper and chemical process industries has been announced by John B. Calkin, co-ordinator of research for Union Bag and Paper Corporation. Offices will be located at 500 Fifth Avenue, New York City 18.

Mr. Calkin, who has been with Union Bag for the past five years, will offer his services as research adviser assisting in co-ordination and administration of research and technical work. Specifically, the new Calkin consulting service will advise clients on problems dealing with process development and efficiency, product development and improvement, commercial chemical development and marketing research, forest research, and packaging efficiency.

Prior to his connection with Union Bag, Mr. Calkins was associated with the Brown Company and Dennison Manufacturing Company. He has had broad experience in pulping, papermaking, converting, and the manufacture and use of chemical by-products. He also has had intimate contact with other industries such as chemicals, fats and oils, plastics, rosin, textiles, paint and varnish, and construction.

Mr. Calkin is a member of a large number of technical, chemical, and trade associations, including the American Chemical Society and the Technical Association of the Pulp and Paper Industry.

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RESINOUS PRODUCTS AND CHEMICAL CO. IS MERGED WITH ROHM AND HAAS CO.

Merger of The Resinous Products and Chemical Company with the Rohm & Haas Company was approved September 15 by the stockholders of both companies. The following officers were named: President, Otto Haas; executive vice president, Duncan Merriwether; vice presidents, C. E. Andrews, A. L. Blount, R. A. Connor, L. W. Covert, D. S. Frederick, E. L. Helwig, L. Klein; secretary, S. C. Kelton; treasurer, W. T. McClintock; assistant secretary, J. F. Bergin, P. J. Clarke, Wm. Kohler; assistant treasurer, T. V. Monahan, George Schnabel. The directors of the company are: Otto Haas, chairman; E. C. B. Kirsopp, vice chairman; William W. Bodine, R. A. Connor, L. W. Covert, D. S. Frederick, W. J. Friedman, F. O. Haas, John C. Hass, S. C. Kelton, L. Klein, Duncan Merriwether.

The relationship between the two firms prior to the merger had been very close. The controlling stock interest in both companies was held by the same group, and manufacturing and selling operations were interrelated.

Since its organization in 1926, The Resinous Products and Chemical Company pioneered in the development and manufacture of synthetic resins for the coatings, plywood, paper and other industries; it is one of the leading producers in this field, its resins being distributed throughout the world under a number of trade names including: Amberol, Uformite, Aquaplex, Duraplex, Paraplex and Amberlite.

The business of Rohm & Haas was started in Philadelphia in 1909 to manufacture and sell Oropon, the original enzyme bate, and other products important to the leather industry. World War I brought the company into prominence as suppliers of industrial chemicals.

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REICHHOLD CHEMICALS INC. PLANS EXPANSION PROGRAM

An expansion program is under way by the Reichhold Chemicals, Inc., of Detroit, Michigan, that is expected to boost the firm's annual sales to the $100,000,000 level in three years.

The firm recently dedicated a new $1,000,000 plant in Ferndale, Michigan, Detroit suburb, which is expected to produce 15,00,000 pounds of phthalic anhydride annually. With six domestic plants, plus single plants in Argentina, Australia, England, France, Italy and Switzerland now in operation, Reichhold intends to open new plants in Stockholm, Sweden, and Hamburg, Germany. Plans are also well advanced for a manufacturing operation in Japan.

Approximately 85 per cent of the firm's output is devoted to synthetic resins.

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▶▶▶ THE FORMATION OF THE Chemical Linings, Inc., with offices located at 407 Electric Building, Watertown, New York, is announced by Murray H. Bennett. The company will engage in installations of digester and accumulator linings, all types of tile constructed chests, tile linings and special acid proof work.

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INTERNATIONAL TRAINING PROGRAM AT WORTHINGTON

An International Student Training Program has been instituted by Worthington Pump and Machinery Corporation, Harrison, New Jersey, as part of its program to create and maintain harmonious trade relations with foreign countries.

On October 1, about twenty-five students from opposite ends of the earth were brought together at the Worthington plant for a six-month training program. The course is open by invitation to those men from abroad who have special qualifications along mechanical or engineering lines.

The students will spend three months at Harrison for complete training on pumping equipment, condensers, feedwater heaters, and water-softening equipment. Then two months at Buffalo Works for training on Diesel and gas engines, compressors, and power transmission equipment. Upon completion of their study at Buffalo, they proceed to Wellsville, New York, and Holyoke, Massachusetts, for study of steam turbines, portable compressors, rock drill equipment and related components, as well as air-conditioning and refrigeration equipment.

At the conclusion of the six-month period, one additional month is devoted to those products for which the student may show a particular aptitude, or which may be of particular importance to the conditions in the student's individual country. Upon satisfactory completion of this course of study, each student is awarded a certificate.

Among the countries represented will be Uruguay, China, Chile, Egypt, Cuba, Holland, Siam, France, Mexico, and Canada.

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▶▶▶ AN INDEPENDENT BOARD of judges, for the Financial World Annual Report Survey, rated Dresser Industries, Inc., Cleveland, Ohio, as having the best 1947 annual report, in its industrial classification, for the fourth consecutive year. The bronze "Oscar of Industry" trophy was presented to Dresser Industries, Inc., at the annual awards banquet in Hotel Pennsylvania, New York.

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▶▶▶ A NEW UNIT has been completed in the plastics division of the Monsanto Chemical Company, Springfield, Massachusetts, for the production of formaldehyde. This unit has brought about the transfer of the company's Lockport, New York, plant, which manufactures formaldehyde products. In moving the entire operation to Springfield, John Garrels, plant manager at the Lockport plant, said that all key personnel would be transferred. The Merritt - Monsanto operation, which is also a subsidiary of Monsanto, will remain in Lockport and will be completely unaffected by the change.

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▶▶▶ A SURVEY OF MANUFACTURING facilities and markets on the Pacific coast is being made by R. A. Emmett, president, and A. O. Thalacker, vice president and general manager of Detrex Corporation, Detroit, Michigan. During their survey, they will make their headquarters at Detrex offices in Los Angeles and San Francisco. Important on their agenda will be means for improving service to customers of Detrex cleaning equipment and chemicals.

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▶▶▶ SALES OFFICES recently have been opened in Philadelphia and Baltimore by the American Lumber and Treating Company. J. P. Johnson, Jr., formerly with the company's Washington, D.C., office, is sales representative in Philadelphia with offices at 123 South Broad Street. W. E. Wilkins, recently in the New York sales department, is the Baltimore representative with offices at the company's new plant on the Fairfield district waterfront.

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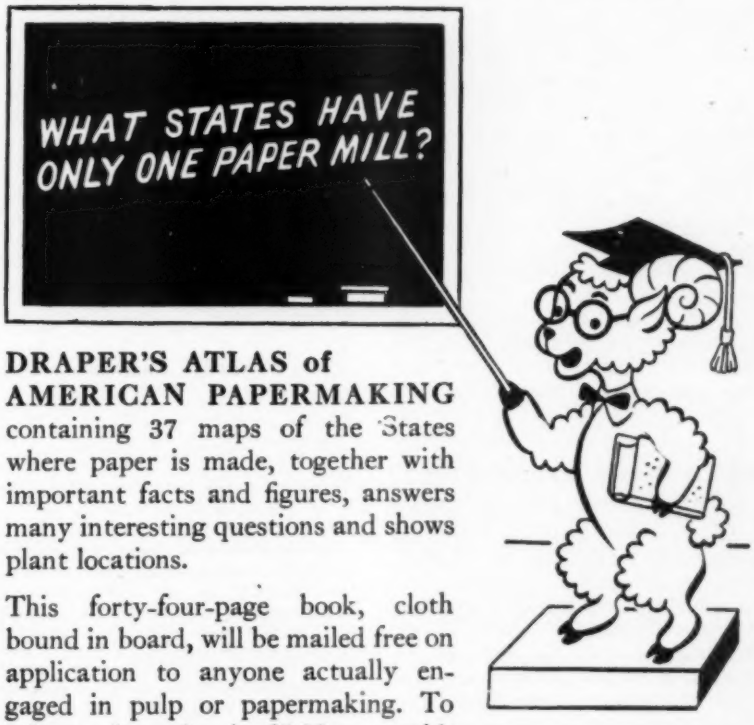
▶▶▶ IN AN EFFORT to decentralize activities, Dr. Johan Bjorksten, president of the Bjorksten Research Laboratories, Chicago, has announced the opening of an additional research center in Madison, Wisconsin. A long term lease has been signed for an entire floor at 323 West Gorham Street. Development work on contract basis for industrial sponsors is their specialty.

What do you know about Paper?



DRAPER'S ATLAS of AMERICAN PAPERMAKING containing 37 maps of the States where paper is made, together with important facts and figures, answers many interesting questions and shows plant locations.

This forty-four-page book, cloth bound in board, will be mailed free on application to anyone actually engaged in pulp or papermaking. To others, the price is $2.00 postpaid, while the edition lasts.

The DRAPER Felt

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856

CANTON, MASSACHUSETTS

Ralph E. Briggs, *Sales Manager*

BRADFORD WEST, Pittsfield, Mass. — WILLIAM N. CONNOR, Jr., Canton, Mass. — L. H. BREYFOGLE, Kalamazoo, Mich.

WALTER A. SALMONSON, 519-20 White Bldg., Seattle, Wash. — L. L. GRIFFITHS, Jr., Kalamazoo, Mich.

Answer to Question No. 10 — Rhode Island, Colorado, Arizona

PRES. TRUMAN APPOINTS JOHN ROCHE DELEGATE TO INT. SAFETY CONFERENCE

On the recommendation of the National Association of Manufacturers and the U. S. Chamber of Commerce, John M. Roche, manager of the industrial department of the National Safety Council, was named by President Truman as official representative of American employers at the international safety conference which opened in Geneva on September 27.

This Technical Tripartite Conference was convened by the International Labor Organization for the purpose of examining a draft model code of safety regulations for factories.

E. G. Quesnel, safety director of the Bordon Company, and a member of the committee which drafted the model code, was appointed adviser to Mr. Roche.

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NCS FINANCE COMMITTTEE ASKS HIGHER PRICES, DUES

From the office of W. G. Johnson, manager of the Membership Department of the National Safety Council, Chicago, comes an announcement that the Council's Finance Committee has recommended a 15 per cent increase in dues, as well as a like increase in prices of supplies and advertising rates. This measure has been recommended to help meet increased costs of operation.

These increases, if approved by the Board of Directors, will become effective January 1, 1949. The announcement states that in order to maintain sound operations, the Council must either reduce the quality and quantity of services or increase revenue.

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SAFETY CERTIFICATE IS AWARDED 2 DEPARTMENTS OF A. E. STALEY MFG. CO.

At a formal presentation, held in the company's main office, two departments of the A. E. Staley Manufacturing Company, Decatur, Illinois, were given the American Mutual Liability Insurance Company's Certificate Award for Safety Record.

Dr. R. E. Greenfield Staley general superintendent received the award from Charles E. Coons of American Mutual; Dr. Greenfield then presented it to Maurice M. Durkee, foreman of the Oil Refinery Department and A. R. Regal, foreman of the Starch Drying Department.

The two departments accumulated 517,380 man-hours without a lost-time accident. To qualify for the award given by American Mutual, an industrial plant or its departments must log at least 250,000 safe hours without a single time-losing injury for 12 consecutive months.

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SAFETY SCORES

▶▶▶ PERFECT SCORES for the second month of the present Paper Industry Safety Contest total 102 as listed below. This number does not include four mills below the minimum size (two in Group D, Div. I, and two in Group C, Div. II).

The August injury rate of 13.23 for all Divisions was slightly higher than the rate of 12.96 reported in July, but the cumulative rate for the two months was only 12.64, indicating that the late July reporters generally had lower rates than those plants included in the July scores.

Division I—Paper and Pulp Mills

Group A

Price Bros. & Co., Ltd., Riverbend, Quebec, Canada.

Mead Corp., Chillicothe, Ohio.

Bathurst Power & Paper Co., Ltd., Bathurst, N.B., Canada.

Price Bros. & Co., Ltd., Kenogami, Quebec, Canada.

Anglo-Canadian Pulp & Paper Mills, Ltd., Quebec, Canada.

Group B

Kimberly-Clark Corp., Niagara, Wis.

International Paper Co., Ticonderoga, N.Y.

Fraser Paper, Ltd., Madawaska, Maine.

Thilmany Pulp & Paper Co. (Upper Mill), Kaukauna, Wis.

Crown-Zellerbach Corp. (Port Angeles Div.), Port Angeles, Wash.

West Virginia Pulp & Paper Co. (Tyrone Mill), Tyrone, Pa.

American Coating Mills Div., Owen, Ill.

Beaver Wood Fibre Co., Ltd., Thorold, Ont.

St. Croix Paper Co., Woodland, Maine.

Mead Corp. (Dill-Collin Div.), Philadelphia, Wis.

Escanaba Paper Co., Escanaba, Mich.

Crown-Zellerbach Corp. (National Paper Products Div.), Port Townsend, Wash.

Howard Smith Paper Mills, Ltd., Beauharnois, Quebec, Canada.

Marinette Paper Co., Marinette, Wis.

Group C

Price Bros. & Co., Ltd., Jonquiere, P.Q., Canada.

Blandin Paper Co., Grand Rapids, Minn.

Donohue Bros., Ltd., Pulp-Paper Mill, Murray Bay, Quebec.

Kansas City Star, Flambeau Paper Div.

Consolidated Water Power & Paper Co. (River Div.), Wis.

Certain-teed Products, Marseilles, Ill.

Mead Corp., Sylva, N. C.

Certain-teed Products, Niagara Falls, N.Y.

Crown-Zellerbach Corp. (National Paper Products Co. Div.), Carthage, N.Y.

National Container Corp. of Virginia, Big Island, Va.

Group D

Hollingsworth & Vose Co., East Walpole, Mass.

Container Corp. of America, Circleville, Ohio.

Container Corp. of America, Carthage, Ind.

United States Gypsum Co., Lisbon Falls, Me.

Armstrong Cork Co., Pensacola, Fla.

Central Fibre Products Co., Tama, Iowa.

Hollingsworth & Whitney Co., Waterville, Me.

Whiting-Plover Paper Co., Stevens Point, Wis.

Strathmore Paper Co. (Mill No. 2), Woronoco, Mass.

Hollingsworth & Vose Co., West Groton, Mass.

United States Gypsum Co., Oakmont, Pa.

Marathon Corp., Ashland, Wis.

Ward Paper Co., Merrill, Wis.

Fort Wayne Corrugated Paper Co., Vincennes, Ind.

Certain-teed Products, York, Pa.

Certain-teed Products, Chicago, Ill.

Certain-teed Products, Richmond, Calif.

Certain-teed Products, Dallas, Tex.

Consolidated Water Power & Paper Co., Stevens Point, Wis.

Latex Fiber Industries (Div. U. S. Rubber), Beaver Falls, N. Y.

Certain-teed Products, Kansas City, Mo.

Mead Corp., Wheelwright Div.

National Gypsum, Garwood, N.J.

Flintkote Co., Little Ferry, N.J.

Riegel Paper Corp., (Riegelsville Mill), Riegelsville, N.J.

Pacific Coast Paper Mills of Washington, Inc., Bellingham, Wash.

Container Corp. of America (California Container Div.), Los Angeles, Calif.

American Writing Paper Corp. (Crocker Div.), Holyoke, Mass.

Spaulding Fibre Co., Inc., North Rochester, N.H.

Strathmore Paper Co. (Mill No. 1), Woronoco, Mass.

International Paper Co., Livermore Falls, Me.

Flintkote Co., Portland, Ore.

American Writing Paper Corp. (Albion Div.), Holyoke, Mass.

National Gypsum Co., Newburgh, N.Y.

Central Fibre Products Co., Inc., Denver, Colo.

American Writing Paper Corp. (Mt. Tom Div.), Holyoke, Mass.

Kimberly-Clark Corp. of Canada, Ltd., Kapuskasing, Ont., Canada.

International Paper Co., Riley, Me.

Division II—Paper and Board Remanufacturing

Group A

Scott Paper Company, Chester, Pa.

Flintkote Co., East Rutherford, N.J.

Gaylord Container Corp., Bogalusa, La.

Group B

Canadian Cellucotton Products Co., Ltd., Niagara Falls, Ont., Canada.

Container Corp. of America, Anderson, Ind.

Container Corp. of America, Cleveland, Ohio.

Container Corp. of America, Emeryville, Calif.

Ohio Boxboard Company, Rittman, Ohio.

Old Colony Envelope Co., Westfield, Mass.

Hankins Container Co., Cleveland, Ohio.

Group C

Allied Paper Mills (Bardeen Div.), Kalamazoo, Mich.

Container Corp. of America, Baltimore, Md.

A. B. Dick Co. (Lake St. Plant), Chicago, Ill.

Orchard Paper Co., St. Louis, Mo.

Container Corp. of America, Seattle, Wash.

Gaylord Container Corp., Atlanta, Ga.

Gaylord Container Corp., Milwaukee, Wis.

Bird and Son, Inc., Chicago Roofing Plant.

Marinette Paper, S. Glen Falls, N.J.

Certain-teed Products, Buffalo, N.J.

S. W. Corrugated Box, Fort Worth, Tex.

Hoerner Corp., Keokuk, Iowa.

Green Bay Box Company (Corrugated Div.), Green Bay, Wis.

Container Corp. of America, Atlanta, Ga.

Kimberly-Clark Corp., Appleton, Wis.

Fort Wayne Corrugated Paper Co., Rochester, N.Y.

Pillsbury Mills, Inc., Wellsburg, West Va.

Container Corp. of America, Greensboro, N.C.

Thilmany Pulp & Paper Co. (Bag Mill), Kaukauna, Wis.

Gaylord Container Corp., Tampa, Fla.

Research Products Corp., Madison, Wis.

Hankins Container Co., Chicago, Ill.

Bay West Paper Co., Green Bay, Wis.

Flintkote Co., Hollywood, Calif.

MATERIAL HANDLING *News*

Reelected!-- by a ROUSING MAJORITY: the CLARK ELEC-CARLOADER!

Campaigning squarely on its record for versatile usefulness and exceptionally low cost, the Clark Elec-Carloader has been enthusiastically endorsed by World Industry as the outstanding materials handling machine of its kind.

More efficient storage and huge savings of time are obvious benefits of the Clark Method.

The preference it enjoys is a tribute to the Elec-Carloader's usefulness in Industry's program of increasing productive capacity within existing facilities; of accelerating output by speeding the flow of materials through processing, warehousing and transit; and of realizing vast potential savings.

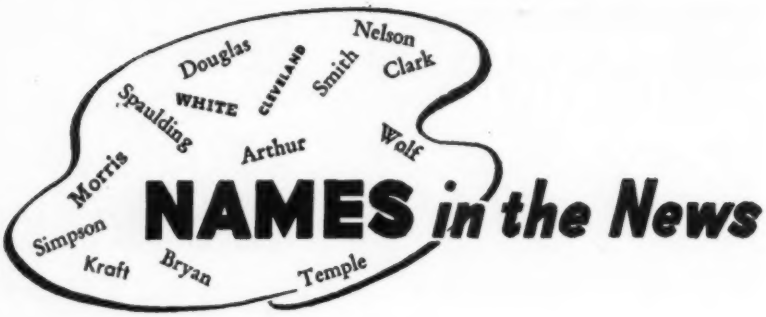
The Elec-Carloader, with its 4000-lb. capacity, is a particularly effective combination of the famous Clark Carloader —outnumbering any other model of fork lift truck manufactured! — and electric battery power, as developed by Clark. Bred into it are Clark's mass production of component parts and of complete machines; Clark's maximum interchangeability of parts; and Clark's unparalleled automotive and materials handling experience.

To get the facts about the Elec-Carloader is to understand the beneficent revolution that is taking place in Industry's handling of materials. They are facts worth knowing, and are readily obtainable from a man worth knowing: a Clark field representative. It's a boon to any business to CONSULT CLARK.

Speed is the money-saving Clark keynote—in storing materials, in getting them out again.

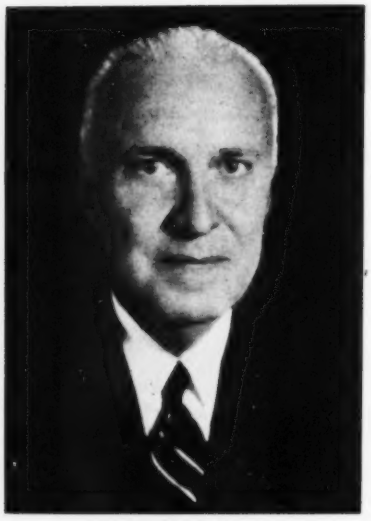
CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS

INDUSTRIAL TRUCK DIV., CLARK EQUIPMENT COMPANY BATTLE CREEK 22, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD
AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS
THE NATIONAL GUARD DEFENDS AMERICA — JOIN NOW



HENRY J. HOWLETT LEAVES AMA TO BE PRESIDENT OF CONTAINER LABORATORIES

The American Management Association announced on September 20 the resignation of Henry J. Howlett, secretary of that Association for the past 13 years.



Henry J. Howlett

Mr. Howlett will succeed the late E. A. Throckmorton as president of Container Laboratories, Inc., packaging and packing engineering consultants with laboratories in New York, Chicago, and San Francisco, and offices in Los Angeles and Milwaukee.

As secretary of the AMA, Mr. Howlett was active in the administration of the conference, research, and membership service programs of the Association's Personnel, Marketing, Insurance, Finance, Office Management, Packaging and Production Divisions during the period of the Association's growth from 1,500 to 12,200 company and individual members. He also directed the AMA National Packaging Exposition, annual trade show at which for the past 18 years the six and one-half billion dollar packaging industry has exhibited developments in packaging, packing and shipping machinery materials, designs and services, and AMA's Conference on Packaging, Packing and Shipping held each year at the same time.

Mr. Howlett will continue to be active in these functions as a member of the Planning Council of AMA's Packaging Division. He will also continue to conduct a course in packaging development and production at New York University which he inaugurated three years ago.

▼

P. J. MASSEY PROMOTED— GOODWILL NOW ST. REGIS MANAGER AT KALAMAZOO

Important announcements made the first week of October by Roy K. Ferguson, president of the St. Regis Paper Company are:

1. Peter J. Massey, who has been resident manager of the company's Kalamazoo (Mich.) mill, has been made chairman of the company's New Products Development Committee and will have headquarters in New York City.

2. Fred C. Goodwill, who has been technical director of the Central Laboratory of the company at Deferiet, New York, will succeed Mr. Massey.

3. John H. Heuer will follow Mr. Goodwill.

P. J. Massey

▼

TWENTY YEARS OF SERVICE WITH EDGAR BROTHERS COMPLETED BY CALLIGHAN

Twenty years of service with Edgar Brothers Company of Metuchen, New Jersey, was completed by O. W. Callighan, Kalamazoo, Michigan on October 1.

O. W. Callighan

Well-known throughout the papermaking industry of this country as a sales engineer, Mr. Callighan started his career as a screen boy and a backtender. Seeing service in World War I as a top sergeant, he returned home to take the pulp and paper course at the University of Maine. Later, in 1926, he completed the course work in pulp and paper at the Institute of Industrial Arts.

At the time of becoming associated with Edgar Brothers, Mr. Callighan was chief chemist and assistant to the general superintendent of Allied Paper Mills, Kalamazoo, Michigan.

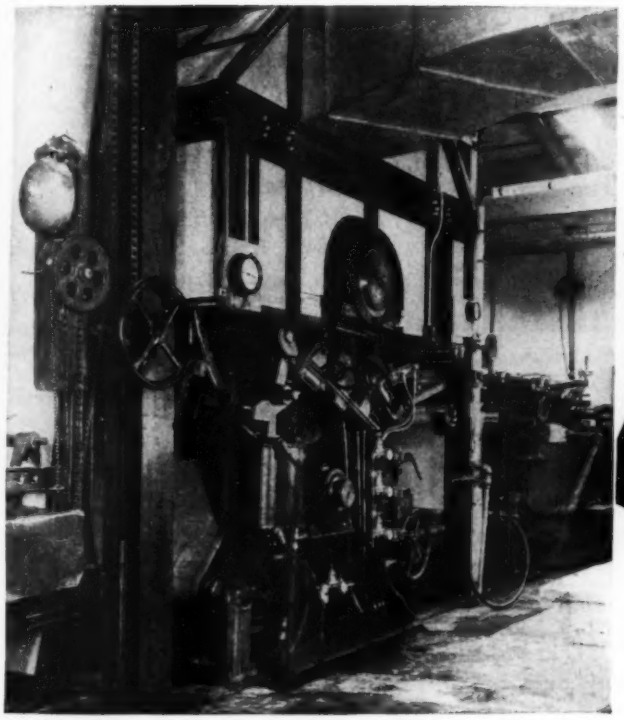
▼

▶▶▶ Recent changes in the Longview (Wash.) Pulp Division of the Weyerhaeuser Timber Company have taken place. *William Pittam,* formerly in the engineering department, has been transferred to the new Springfield, Oregon, construction job as assistant to the construction engineer on the new

Sandy Hill

HELPS PUT THE STRENGTH AND SOFTNESS INTO

Golden Fleece Tissues



Photograph courtesy of Brown Company

Producing an extra high grade tissue like Golden Fleece presents problems. Sandy Hill is proud of the result.

One of the two Sandy Hill Cylinder Machines just installed in record time in the Golden Fleece Co., Inc. plant in Bancroft, Mass.

At the "Golden Fleece" plant in the record time of eight weeks, two old machines were ripped out and necessary floor changes made, two new machine sections installed by Sandy Hill, and saleable paper resumed rolling into the converting room.

This is one of a wide variety of Sandy Hill's recent installations, which include a 132 inch (wire width) Fourdrinier in Ohio, an 80-dryer machine for roofing felt in New Jersey, two facial tissue machines in New York and a long list of other paper machines and specialties.

Sandy Hill Iron & Brass Works

Hudson Falls, N. Y.

Machinists and Founders Specializing in Paper and Pulp Mill Machinery

Manufacturers of
Adjustable Cylinder Vats
Cylinder Paper Machines
Pulp Grinders
Dandy Roll Drives

Pulpers or Kneaders, Voith
Thickeners
Quick Opening Gate Valves
Bertrams Flow Distributors
Bertrams Shakes

Neilson Slice
Feltless Wet Machines
"Selective" and Corner Drives
Fourdrinier Paper Machines
"Packer" Screens

Castings
Bleaching Equipment
Scofield Felt Conditioners
Cleveland Type Bearings
Shaker Screens

unbleached kraft pulp mill. *Melvin F. Stewart,* has been promoted to chief accountant of the pulp division's operations at Springfield, Oregon. *Robert Weed,* who had been employed in the Longview office of the pulp division, has been transferred to Springfield as an acconutant.

▼

MATHIESON CHEMICAL CORP. NAMES DR. CARL PRUTTON AS NEW RESEARCH DIRECTOR

The former head of the department of chemistry and chemical engineering at Case School of Applied Science, Dr. Carl F. Prutton, has joined Mathieson Chemical Corporation as director of research.

Dr. Prutton was a faculty member at Case from the time of his graduation from that school in 1920. He was a consultant to the Lubrizol Corporation, until he joined Mathieson and was a consultant to The Dow Chemical Com-

Dr. Carl F. Prutton

pany. He has served as chief of the Process Development branch of the office of rubber director and was also consultant to the War Production Board. Dr. Prutton holds over a hundred patents on petroleum products, chemical processes and plastics, and is the author of many scientific papers in the fields of physical chemistry, lubricants, corrosion, chemical engineering and education, and since 1944 has been a member of the editorial advisory board of *Industrial and Engineering Chemistry.*

▼

▶▶▶ A newly created position in the Hewitt-Robins, Inc., organization, Buffalo, New York, is export manager. Appointed to this position is *J. J. Murray* who has served in various export capacities with this company for the past 28 years.

VOKES AND NICHOLSON ARE APPOINTED NEW POSITIONS IN DILTS MACHINE WORKS

R. F. Vokes was recently appointed assistant general manager of Dilts Machine Works, Fulton, New York, Division of the Black-Clawson Company. He is being succeeded as director of laboratories by G. B. Nicholson, Jr.

A writer and speaker on stock preparation and other technical subjects, Bob Vokes is well-known to the papermaking industry. He obtained his higher education at Syracuse University where he majored in pulp and paper science. After serving as technical control chemist at the Fulton Division of

Robert F. Vokes (left) and George B. Nicholson, Jr.

Armstrong Cork Company, he became associated with Dilts in 1938. Two years later, he was appointed head of research and development. In this capacity, Mr. Vokes contributed toward the development of the Hydrapulper, Classifiner, and other machines.

After graduating from the New York State College of Forestry, George Nicholson joined the Dilts organization. His career at Dilts began in the engineering department. It was quickly interrupted by World War II, in which Mr. Nicholson served as a first lieutenant. Returning to Dilts, he was assigned to the order department. In 1947, he became a research engineer in the Dilts research and development department, stepping into the shoes of Bob Bokes as director of laboratories a year later.

▼

D. J. ERIKSON ELECTED AS PRESIDENT OF HAGAN CORP.

Starting his career with the Hagan Corporation as a draftsman more than three decades ago, D. J. Erikson has been elected president of Hagan and its subsidiary companies—Calgon, Inc., Hall Laboratories, Inc., and Buromin Company.

He succeeds J. M. Hopwood, president of Hagan Corporation since 1918, the only man to predate Mr. Erikson in point of service with the company. Mr. Hopwood was elected to the new position of chairman of the board of directors of the Hagan group.

On July 1, 1939, Mr. Erikson was elected vice president in charge of sales. Associates regard the new Hagan president as perhaps the only man, with the exception of Mr. Hopwood, with an intimate working knowledge of the diversified products and services of the parent company and its subsidiary firms.

▼

▶▶▶ The advancement of *James J. Forsythe* to the position of technical superintendent of the International Paper Company plant, Niagara Falls, New York, has been announced. Mr. Forsythe has been with the Niagara Falls plant for two years; he was formerly with the Hawthorne Paper Company, Kalamazoo, Michigan, and the Fraser Paper Companies, Madawaska, Maine.

▼

MORLAN J. GRANDBOIS IS NOW ASST. S. M. ONE DIV. ST. REGIS SALES CORP.

The appointment of Morlan J. Grandbois as assistant sales manager in the Printing, Publication and Converting Paper Division, directing merchant sales, is announced by E. G. Murray, executive vice president of St. Regis Sales Corporation, subsidiary of St. Regis Paper Company.

Mr. Grandbois leaves the advertising publicity and sales promotion department where he handled St. Regis ad-

M. J. Grandbois

vertising for all divisions and more recently devoted his entire time to the development of a merchandising program for commercial printing papers. He became associated with St. Regis as a result of the acquisition by that company of the Bryant Paper Company in 1946.

IF YOU EMPLOY 100 PEOPLE OR MORE...

YOU CAN MAKE THESE YOUR *Success Stories!*

Payroll Plan for U. S. Savings Bonds actually increases worker production, as demonstrated in large and medium-sized companies throughout the nation. Here are some examples:

PAYROLL SAVINGS MAKES EMPLOYEES MORE CONTENTED

In General Motors' My Job Contest, approximately 15,000 GM men and women gave the Payroll Savings Plan as one of the reasons they like their jobs!

PAYROLL SAVINGS CUTS ABSENTEEISM

A survey made by a smaller company in Minnesota showed that during a recent three-month period employees not on payroll savings were absent almost 2½ times more frequently than those who were on the Payroll Savings Plan. Further proof that payroll savings cuts absenteeism!

PAYROLL SAVINGS REDUCES ACCIDENTS

Records at our eleven Navy Yards show that, as participation in the Bond program increases, accident frequency and accident severity decline. When participation at the Norfolk Navy Yard climbed to over 90%, accident frequency declined over 50%, and the accident severity index dropped to 1/6 its former level!

Hundreds of companies are reporting benefits like these! Obviously, they add up to increased production.

What's more, the Payroll Savings Plan is a powerful weapon against inflation. Every Savings Bond dollar built up in the Treasury retires a dollar of the national debt that is potentially inflationary. That's good for the country's future—which means it's good for *your company's* future.

And, of course, it's good for the employee's future, because the Bonds pay $4 at maturity for every $3 invested.

If your company has the Payroll Savings Plan, make sure you and your employees are getting the most out of it! If you haven't yet installed the Plan, you're missing something! For facts or help, call your Treasury Department's State Director, Savings Bonds Division.

The Treasury Department acknowledges with appreciation the publication of this message by

The Paper Industry and Paper World

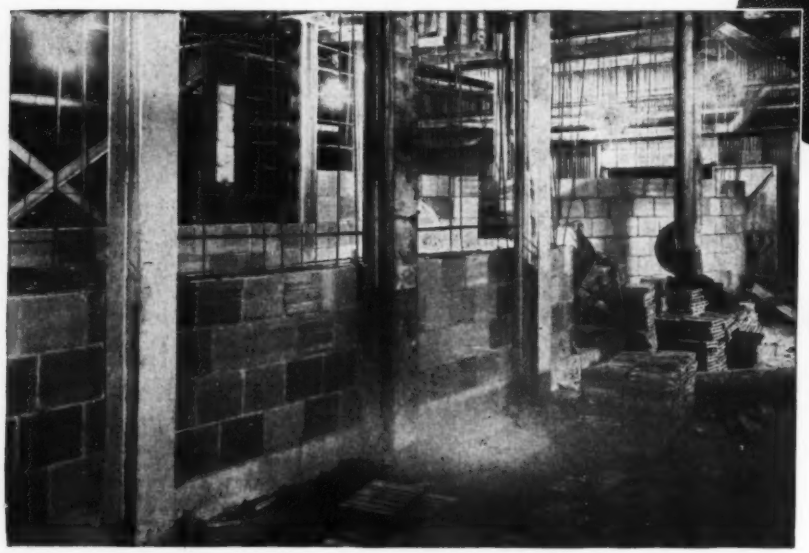
This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council.

Another Use for KALAMAZOO GLAZED TILE

Showing a machine chest—refinery stock chest and a raw stock chest all being built of Kalamazoo Glazed Tile.

Kalamazoo tile is ideally adaptable to all three types of chest due to extreme strength, the easy-to-keep clean surface and low maintenance costs.

A Series of 3 New STOCK CHESTS



KALAMAZOO TANK & SILO CO.

KALAMAZOO, MICHIGAN

In making this announcement, Mr. Murray stated that the recent acquisition of new mills and the expansion of existing paper producing facilities of the company's Printing, Publication and Converting Paper Division now makes it possible for St. Regis to carry out a long contemplated plan of selling to the commercial printing market through paper merchants.

▼

▶▶▶ The directors of the Thomas A. Edison Corporation, New York City, announce the addition of *A. P. Mitchell* to the board, succeeding Mrs. Mina M. Edison, widow of Thomas A. Edison. Mr. Mitchell is a vice president, director and general sales manager of the Riegel Paper Corporation, New York City.

▼

▶▶▶ The resignation of *L. W. Bailey*, electrical superintendent for the Weyerhaeuser Timber Company's pulp division at Longview, Washington, was effective September 30. He will enter the electrical contracting business in Kennewick, Washington. His employment at Longview began in July, 1931 prior to which he was with the Grays Harbor Pulp and Paper Company at Hoquiam, Washington. Succeeding Mr. Bailey is *C. B. Fahey*, formerly of the Diamond Match Company at Ogdensburg, New York, and the Aluminum Corporation of America.

▼

WEBER APPOINTED BY LINK BELT TO HEAD SALES OF PULP AND PAPER INDUSTRY

In order to better serve the pulp and paper industry, the Link-Belt Company, Chicago, Illinois, announces that it has appointed Mr. H. F. R. ("Bob") Weber the representative of the company to the pulp and paper industry. In his new position, he will have the full support of the company's plants and far-flung sales and engineering departments.

H. F. R. Weber

Mr. Weber started working for Link-Belt in 1915 at the Philadelphia plant as power transmission engineer. The period from 1917 to 1920 was spent in the U. S. Army. He became district manager in charge of positive drive sales at Chicago in 1926; was appointed central division manager for power transmission in 1944; and since 1945 has been divisional manager for silent chain drives, with headquarters in Indianapolis.

Long specializing in paper mill work, Mr. Weber has a wide acquaintanceship among paper mill operators and superintendents throughout the industry.

▼

▶▶▶ From the position of manager of its Chicago district to manager of the company's newly-formed midwest region is the promotion given *B. F. Bilsland* by Allis-Chalmers Manufacturing Company, Milwaukee. This new region, the eighth under a long range sales and expansion program launched in December, 1945, embraces six district and six branch offices.

▼

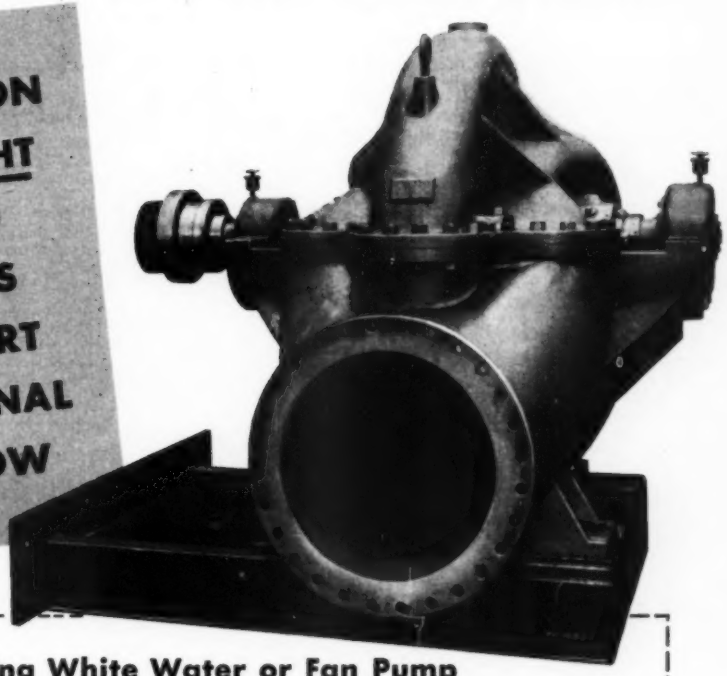
▶▶▶ The management of the Chicago branch of E. C. Atkins and Company, Indianapolis, Indiana, has been taken over by *Burleigh Owens*. Mr. Owens was formerly located in the company's Cincinnati office.

▼

▶▶▶ Controller of the Westfield River Paper Company, Inc., Russell, Massachusetts, *Earl E. James*, has been elected to membership in the Controllers In-

A PROVED WAY TO BETTER PROCESS-PUMPING

WORTHINGTON FITS THE RIGHT PUMPS TO YOUR JOBS WITH EXPERT APPLICATIONAL KNOW-HOW



An Outstanding White Water or Fan Pump

Of quality materials throughout, machined to rigid tolerances, the Worthington Type LA is the last word in single-stage volute design — hydraulically and mechanically. And you have your choice of three variable speed power hook-ups — for steam, for constant speed motor through magnetic coupling, or for multi-V drive — all engineered by Worthington.

For all heads and capacities, with consistencies up to 1%.

Take any Worthington Centrifugal Pump, examine it feature by feature, and you'll see what it means to have the greatest research and manufacturing facilities in the field. For Worthingtons are heavier, more solid—built to last longer, with many exclusive design improvements for better performance.

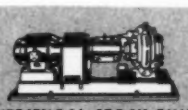
The Type LA is just one of Worthington's comprehensive range of paper-processing pumps—each built to give you peak efficiency and economy in the work for which it was designed.

And for best results in *every* application, Worthington draws on the biggest stockpile of practical knowledge in the business—built up through more than 100 years of experience. For further proof that *there's more worth in Worthington*, call our nearest District Office. Or write to *Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, N. J.*

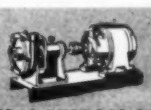
WORTHINGTON

CB-7

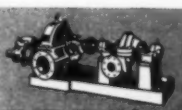
THE WORLD'S BROADEST LINE ASSURES YOU THE RIGHT PUMP FOR EVERY JOB



CENTRIFUGAL STOCK PUMPS Type FP. Handle all kinds of stock up to 7% consistency. 4 sizes. Capacities up to 6000 GPM; heads up to 200 ft.; speeds up to 1750 RPM.



GENERAL PURPOSE PUMPS Type CF. Open impeller. Single stage. Sizes 1" to 4". Capacities up to 1000 GPM; heads up to 130 ft.; speeds up to 2475 RPM.



BOILER FEED PUMPS Type UB-2. 7 sizes. Capacities up to 1500 GPM; heads up to 1000 ft.; speeds up to 3600 RPM.

stitute of America. The top financial executives of 3,206 leading American companies in every branch of industry are members of the Institute which was founded in 1931.

▼

C-Z CHANGES ANNOUNCED—ACKLEY GOES TO WEST LINN

The transfer of Charles Ackley from the position of paper mill superintendent of the Port Angeles (Wash.) mill of Crown Zellerbach Corporation to a similar capacity at the C-Z mill at West Linn, Oregon, has been announced. Mr. Ackley is third vice president of the American Pulp and Paper Mill superintendents Association. At West Linn, Mr. Ackley replaces J. A. Harris, who has asked for release from full-time duties ahead of his retirement in 1950.

Appointed to succeed Mr. Ackley at Port Angeles is Claude Kelley, formerly paper mill superintendent of Pacific Mills Ltd., at Ocean Falls, British Columbia.

▼

▶▶▶ Reopening of the Buffalo, New York, branch office is announced by the Crocker-Wheeler Electric Manufacturing Company, Division of the Joshua Hendy Corporation, Ampere, New Jersey. The new branch, operating directly under the New York District Manager, is headed by *Louis E. Rau*. A graduate of the Newark College of Engineering, he came to Buffalo after several years on the staff of the New York District Office.

▼

▶▶▶ With the company for many years, *Arthur J. Campbell*, formerly general sales manager of the Industrial Chemicals Division of American Cyanamid Company, New York City, has been appointed division manager of that division.

▼

▶▶▶ New appointee in charge of purchasing at the Hazleton, Pennsylvania, plant of Oliver United Filters, Inc., is *Russell Runyan*. He was formerly with the same company's purchasing department in Oakland, California.

▼

▶▶▶ *Robert W. Howard* has been appointed by Moore & White, Philadelphia, as sales engineer for the area of Pennsylvania, New York and New Jersey. Mr. Howard was formerly with the Holyoke Machine Co., Holyoke, Massachusetts.

▼

▶▶▶ Joining the staff of the West Coast Lumbermen's Association is *Emmett Stoddard*, who has been with the Hawley Pulp and Paper Company at Oregon City, Oregon, as office manager and accountant for eight years. He will be administrative assistant to the secretary, Harris E. Smith.

▼

▶▶▶ Promoted to the office of vice-president in charge of the development department of Mathieson Chemical Corporation, New York City, is *Dr. D. P. Morgan*. He recently joined the company as administrator of research and development.

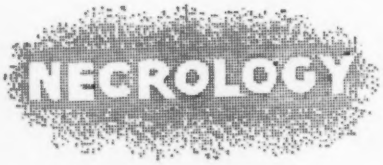
▼

▶▶▶ A recent appointment in the E. P. Lawson Company, Inc., New York City, is *Adam Altglass*. He will serve as manager of the manufacturing division of the company.

▶▶▶ Officers recently elected by the Whiting-Plover Paper Company, Stevens Point, Wisconsin, are *George A. Whiting*, executive vice president; and *A. J. Schierl*, secretary-treasurer and general manager. Other officers of the company are F. B. Whiting, president, and Thomas Leech, vice president and sales manager.

▼

▶▶▶ Named head of the newly created Hyster Engineering Standards Department is *Paul Brainard*, former assistant supervisor of hoist design at the Hyster Company, Portland, Oregon. Under his direction the new division will work toward the standardization of design and materials in Hyster's three factories, located in Portland, Oregon, Peoria and Danville, Illinois.



ALDUS C. HIGGINS

For nearly a half a century closely identified with Norton Company, Worcester, Massachusetts, Aldus C. Higgins, passed away recently at his home in Worcester at the age of 75. Mr. Higgins was chairman of the Norton Company executive committee. His first

Aldus C. Higgins

Norton employment was as patent counsel. He had served in many Norton executive positions including that of president, general manager and chairman of the board of directors.

On his 75th birthday, Mr. Higgins was honored by the King of Sweden during the annual Norton Company service awards party. He was decorated by the King, through the Swedish Consul-General, with the Royal Swedish Order of Vasa, first class, with the rank of Chevalier. The decoration was bestowed in recognition of his outstanding contributions to industry and art.

He is survived by his widow, a daughter and a son.

▼

NORMAN DOUGLAS WILSON

On September 30 Norman Douglas Wilson, son of Norman W. Wilson, president of Hammermill Paper Company, Erie, Pennsylvania, met with a fatal accident.

Mr. Wilson was employed in the Purchasing Department of Hammermill. Prior to the War, he attended Princeton University. During the war, he served in the U. S. Navy.

He is survived by his widow and two children.

▼

▶▶▶ Retired president of Parsons and Whittemore, Inc., paper importers and exporters of New York City, *Howard Whittemore*, passed away September 17 at the age of 83. He was with the Standard Oil Company of New York and the Anglo American Oil Company in London before he joined the Parsons concern.

▼

▶▶▶ *Emil R. Gasser*, chief physicist of Farrel-Birmingham Company, Inc., Ansonia, Connecticut, passed away recently at the age of 44. Mr. Gasser was first employed by Farrel-Birmingham in 1928 and, for the past three years, was director of research activities with headquarters at the laboratory of the company's Buffalo, New York plant. Surviving are his widow and one son.

Why

No single type of dryer felt will meet the needs of all mills. But HOOPERWOOD "Canvas Engineering" has the answer to that problem—a specific HOOPERWOOD Dryer Felt for each requirement.

If it is a rugged, heavy felt you need for fine finish in normal production . . . or a lightweight, extra-porous felt for faster drying . . . or an Asbestos Felt to withstand advanced temperatures in high speed production of Kraft and other heavy papers—there is a HOOPERWOOD felt to fit your need.

Mill Superintendents find this service invaluable in suiting the particular requirements of their mill—even down to each machine position if desired.

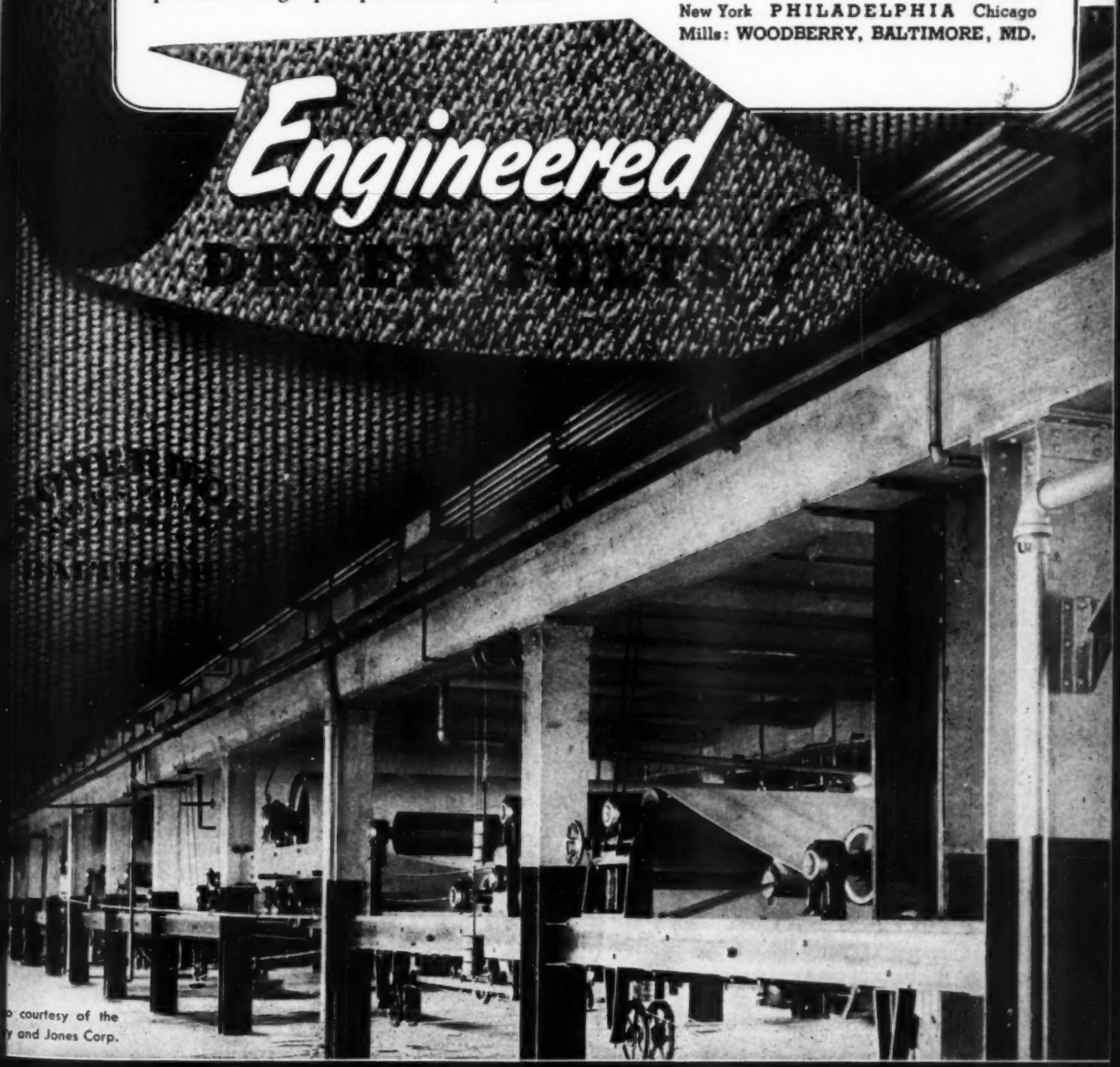
Make your next felt *right*—specify HOOPERWOOD.

WM. E. HOOPER & SONS CO.

New York **PHILADELPHIA** Chicago

Mills: WOODBERRY, BALTIMORE, MD.

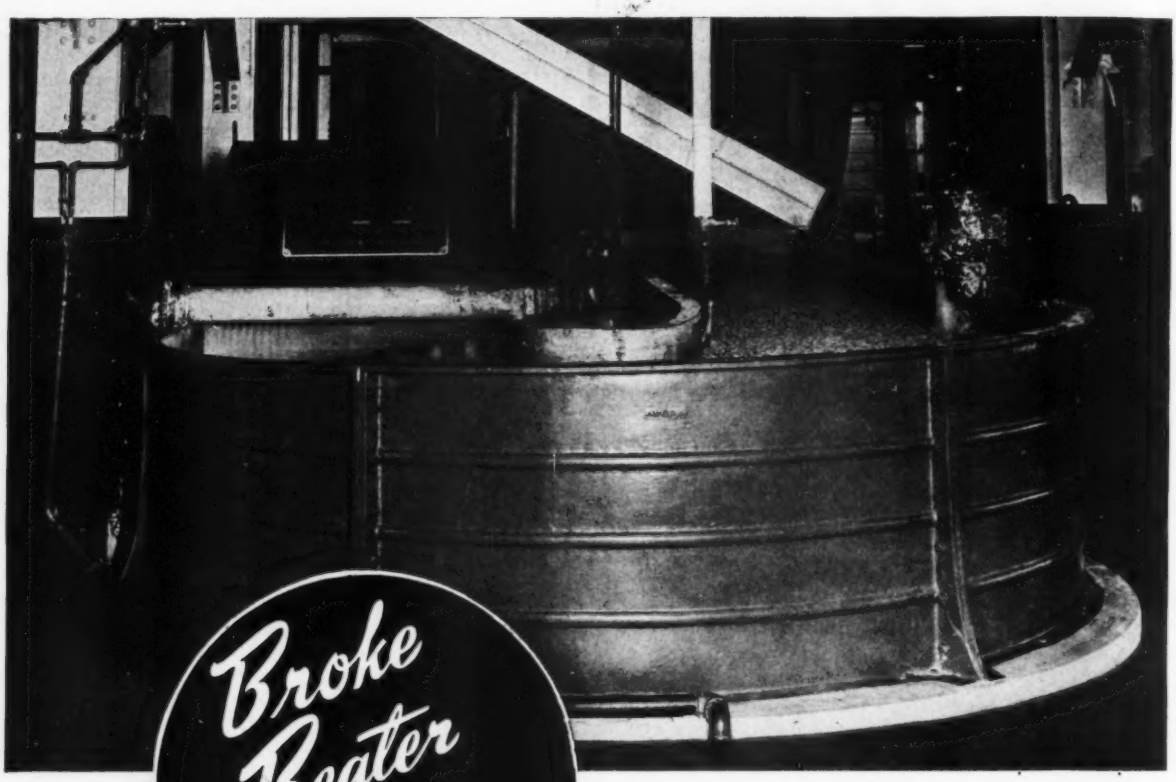
Engineered



courtesy of the
y and Jones Corp.

HOOPERWOOD DRYER FELTS

COTTON AND ASBESTOS



Broke Beater BY VALLEY

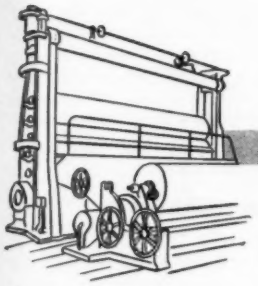
Chosen by progressive mills here and abroad for EXCELLENCE

CHECK THESE FEATURES:

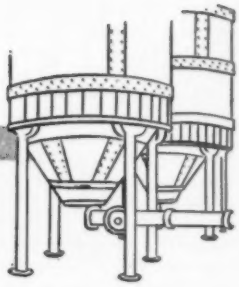
- Hollow Midfeather, originated by Valley
- Short Roll Centers
- Replaceable Knives, Re-usable in 4 positions
- Continuous or Batch Operation
- Rugged Enduring Construction throughout
- Built on the accumulated experience of Decades of Beater Building

VALLEY IRON WORKS CO. • APPLETON, WIS.

Slices and Head Boxes • Screw Presses • Valley Vortex Pulpers • Laboratory Equipment
Pulp Washing Systems • High-Speed Beaters • Broke Beaters • Vortex Beaters • Plug Valves
Flat Screens • Thickeners • Deckers • Paper Markers • Roll-Headers



Practical SHORTS



Readers are invited to submit short, practical articles for this department. The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible, articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.

Increase Twist Drill Life by Proper Sharpening

Excessive drilling costs and imperfectly drilled holes can be traced in most cases directly to improper grinding of the drill point. In its ability to perform the task for which it is designed, no tool is more handicapped by improper maintenance; still the common twist drill is given less thought in regard to its proper use and reconditioning than perhaps any other tool. The useful life of the drill can be increased measureably by paying more attention to its maintenance and sharpening.

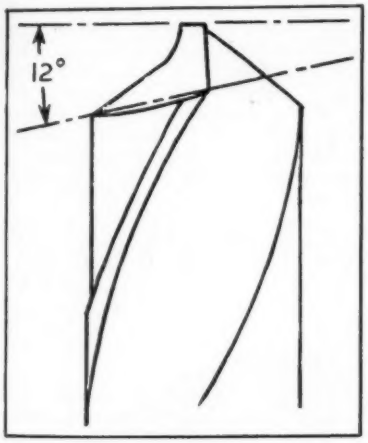


Fig. 1—Lip clearance

It is extremely difficult to sharpen a twist drill correctly by offhand grinding. Because of this, it is recommended that twist drill sharpening be done on machines especially designed for this work.

Procedure in Sharpening a Drill

The first step is to grind the cutting lips so that they have the same length, the same and correct angle with the axis of the drill, and the correct clearance behind the cutting edges. A standard drill sharpening machine should be used for this operation.

Next, the point is thinned, if necessary, by grinding a short groove on each side of the web. Point thinning can be accomplished by offhand grinding on a round-faced wheel or on a special drill point-thinning machine which accurately controls the thickness of the web and automatically centers the point to insure that the drill will cut true.

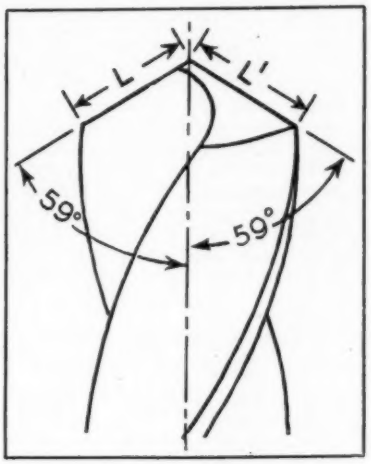


Fig. 2—Both lips must be at same lip angle and equal length (L=L')

Lip Clearance

The lip clearance on a drill is the relief behind the cutting edge. This clearance should be sufficient for the drill to cut freely, yet not enough to weaken the cutting edge. If the lip clearance is insufficient, the drill will not cut readily and excessive pressure is required to enable the drill to cut at all. This pressure, plus the heat that is generated in such an operation may cause the drill to "split up the center." If the lip clearance is too great, the cutting edges will tend to chip and break down due to insufficient backing.

The usual clearance is about 12 degrees to 15 degrees at the periphery of the drill. This increases constantly towards the center and is considered standard for the average type of work. When this angle is correct, the chisel point or web intersection is at an angle of 130 degrees to 135 degrees to the cutting edge. This clearance insures free cutting action and yet is not enough to weaken the cutting edge. Chipping of the cutting edge or splitting of the drill often results from unequal clearance angles.

Because of this, it is recommended that twist drill sharpening be done on machines especially designed for this work.

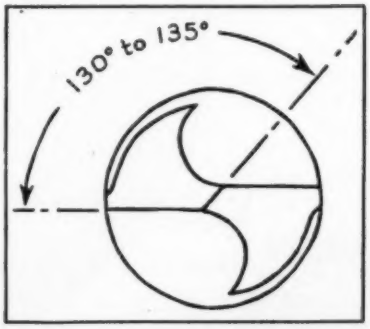


Fig. 3—Lips properly ground but web requires point thinning

Angle of Point

The two cutting lips must be inclined at the same angle with the axis of the drill and, in addition, must be of an equal length. If both lips are not ground at the same angle, the drill is subject to early failure as the lip having the largest angle is doing all of the work. A hole produced by such a drill will be larger in diameter than the drill itself; also, if the lips are not of the same length, the point of the drill will be off center and the hole will be drilled oversized.

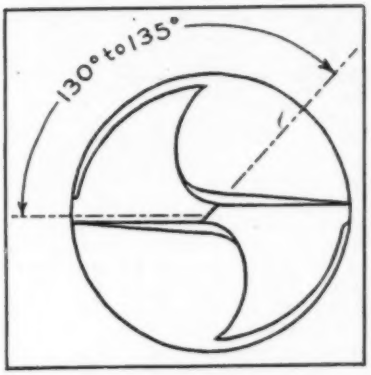


Fig. 4—Web after point thinning

For general purpose work, each cutting lip should be at 59 degrees to the axis of the drill. This included angle of 118 degrees (commercial standard) has been found most generally satisfactory. For soft cast iron, a somewhat more acute angle, about 90 degrees will give best results. For brass, the standard angle of 118 degrees may be used, but the face on the cutting lip should be ground slightly flat.

Thinning the Web

The web of a drill increases in thickness as the center is approached; thus as the drill becomes shorter through repeated grinding, the web becomes thicker. If the web at the chisel point is too thick, excessive pressure

will be required to start the drill since the central web can do no cutting and it will tend to rub. It then becomes necessary to reduce the thickness of the web by grinding.

Thinning of the web is a delicate operation. It must not be carried too far up the flute, nor should the web be ground too thin as otherwise the drill will fail because the point will be so weakened, it will be unable to withstand the thrust of drilling. The proper web thickness at the chisel point should be held to about one-eighth the diameter of the drill. Care should be exercised to maintain the exact center of the drill as otherwise it will cut over-size.—W. L. HARDY, *Grits and Grinds*, Norton Company, Worcester 6, Mass.

▼

Boiler Tubes That Are Cleanest Scale the Most

The above title sounds almost like a contradictory statement, doesn't it? Yet it is a fact. The catch that "gets 'em" is that the words "on the outside" are omitted. In other words, the tubes that are dirty with soot will not get so dirty inside, because soot is about as good an insulator as there is against the flow of heat. Authorities declare that soot is a more effective insulator than asbestos, and that is "going some." To cause all boiler tubes to scale an equal amount in a given time, therefore, it behooves the operator of the soot blower to keep all tubes equally clean from top to bottom. And even then, unquestionably, there will be considerably more scale in the bottom tubes where heat is most intense. The tube that absorbs the most heat will naturally evaporate the most water and therefore will leave the most scale to cling to and impair the heat transmitting qualities of the tube. Thus the boiler is "twixt the devil and the deep sea" in that it is beset on both sides by a substance that is injurious to the plant owner's pocket book directly through the coal pile—soot on the outside and scale on the inside. If it is a fire tube boiler the reverse is the case.

Also, this explains why it is that in many boilers scale in the tubes is thicker on one side of the boiler than on the other. In such boilers it is usually found that the soot is blown off the tubes through the dusting doors at the sides of the setting. The cleaning, however, is not thorough enough because the boiler is not equipped with the proper kind of apparatus for regular cleaning. A hand lance thrust through the dusting doors does not clean the "far side of the boiler. Instead of cleaning the tubes on the far side it blows the soot from the "near side" over onto the tubes farther away and makes matters worse over there. In some cases it has been found that spaces between tubes have been packed completely full of soot, and the tubes might just as well not have been in the boiler at all. By investigating a problem of this kind with care, and studying the cross-section of a typical horizontal water tube boiler, it will be readily understood why and how it is possible for the tubes to become packed full of soot where hand lance blowers are still used.

Of course the better way to remove the soot is to install a permanent soot blower on top of the tube bank and blow down between the tubes. The soot is thus cleaned off from one side of the boiler to the other in a workmanlike manner, and instead of having the jets blow the soot against the wall it is blown downward into the clear space below the tubes. It is impossible, in designs of this kind, for the tubes to become clogged full of soot. Scale formation, also will be uniform from side to side. It has been pointed out that during the scaling process some of the workmen "think" that the scale is thicker on one side than the other. The thickness, it is said, varies directly with the tiredness of the man. There may be some truth in this alleged belief by workmen, but it nevertheless does not alter the facts stated above.

And, lastly, it has also been said that much depends upon the way in which the fireman shovels coal into the furnace—if it is a hand-stoked boiler. If the man is left-handed he may throw more coal to one side than to the other, and thus keep one side of the boiler hotter. There may be some truth to that, too, but the fact remains that the tubes that evaporate the most water or absorb the most heat are the ones that will accumulate the thickest scale in the shortest time.—W. F. SCHAPHORST, M. E.

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Do You Know Why Antifriction Bearings Require Lubrication?

Every reader has doubtless been told from time to time that ball bearings and roller bearings really don't need oil for reducing friction. We are told that "the lubricant in an antifriction bearing performs on plain bearings." It is claimed that "the purpose of a lubricant in a ball bearing is merely to preserve the highly polished surfaces of the balls and races." It is said that "the balls and races are always in point contact."

But that is not true. To begin with, there is no point contact; it is surface contact. When a hard steel ball is pressed against a race it is slightly flattened and "sinks into" the race, as shown in Figure. 1. When two balls are pressed against each other, as in Figure 2, the contact surface is perfectly flat. So now, obviously, when either of these balls, Figures 1 or 2, is "rolled," there is bound to be some friction, the latter being unavoidable. This is best illustrated by taking two pieces of flat rubber, Figure 3, pressing them together with a ball between, and rolling the top one on the other, as indicated. Whether the ball is of steel or rubber, the frictional resistance will be found to be considerable. With a rubber ball the friction will, of course, be greater. But it is now evident that, in a way, lubricating oil performs the same functions in a ball or roller bearing as in a plant bearing, although not to so great an extent. You can see, too, why it is so important to use strong and hard steel in antifriction bearings.—W. F. SCHAPHORST, M. E.

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Maintenance of Heat Insulation

To provide maximum insulating value, all heat insulation requires a regular inspection and maintenance program. The steps in such a maintenance program are outlined by the Magnesia Insulation Manufacturers Association, as follows:

1. Periodic inspection to see that all sources of heat loss, such as new sections of piping, etc., are insulated.

2. Periodic evaluation of insulation thickness, since changes in operations or fuel costs may necessitate an increase in thickness.

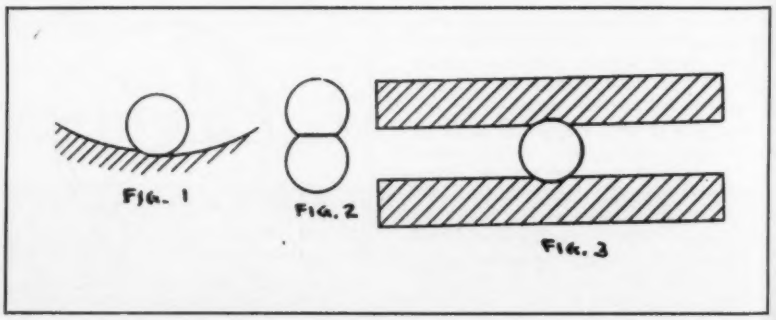
3. Survey of insulation jacketing to check for adequate protection against weather, mechanical or chemical damage, etc. Scorched spots are thoroughly investigated, since they may indicate a crack or failure in the insulation underneath, or may be a sign that the insulation is too thin.

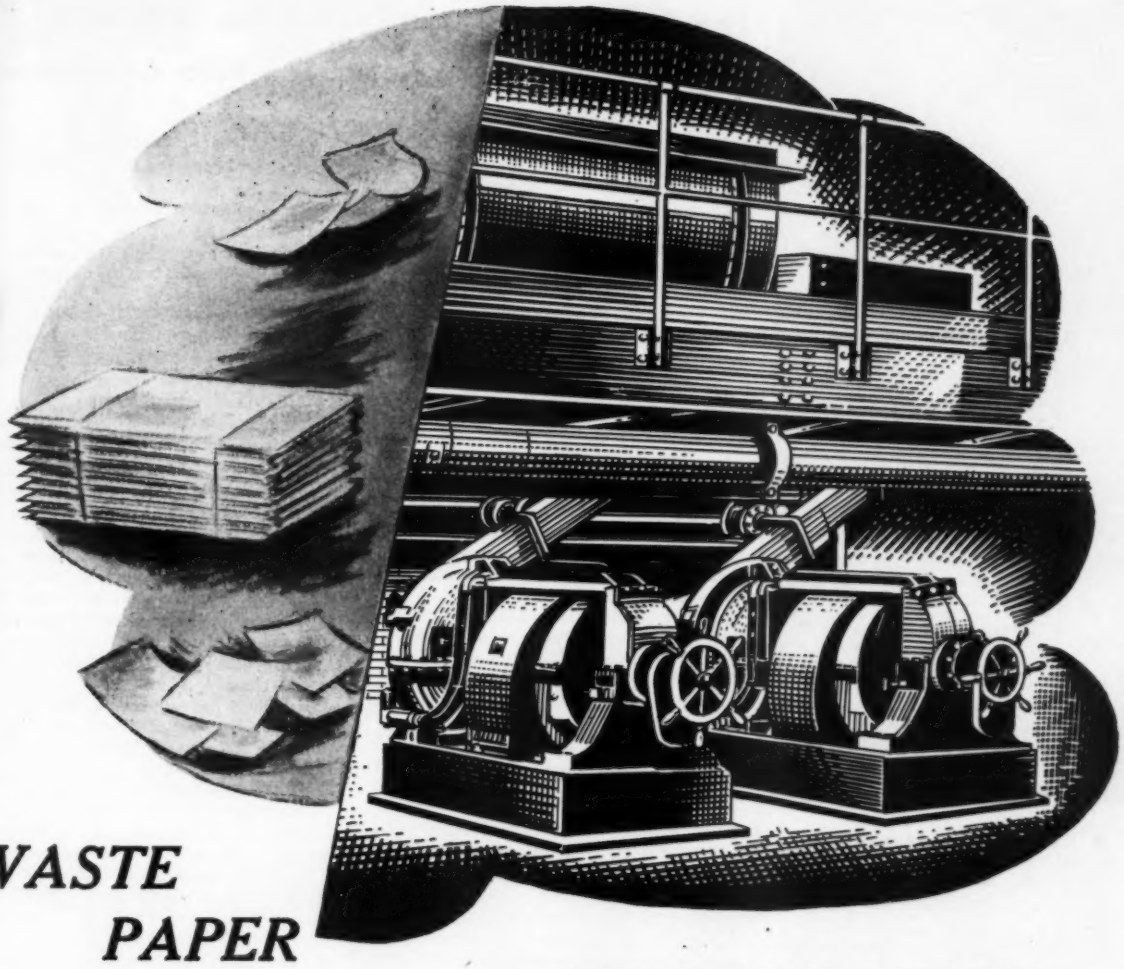
4. Check of the insulation for loosening. If due to excessive vibration of the insulated equipment, the cause of vibration is eliminated, if possible, and the insulation is reapplied and tightened. Joints are pointed up with cement and the canvas or other jacketing replaced and securely sealed. If the vibration cannot be eliminated or reduced, another method of application of insulation may be necessary.

5. Examination for dents or cracks. Dents may be caused by mechanical abuse of insulation, such as erection of scaffolding, etc. The damaged section is cut out and a new one of the same size and shape is wired on securely. The cracks are filled with insulating cement and the protective jacketing is replaced.

6. Check after repairs of equipment due to difficulties such as water hammer, leaks, etc., which may have caused damage to the insulation.

7. Survey of insulation after disasters such as fires, floods, etc. Lines or equipment on which insulation has been saturated by water should be brought up to full temperature slowly to prevent too rapid formation of steam between the hot surface and the insulation. — THE MAGNESIA INSULATION MANUFACTURERS ASSOCIATION.





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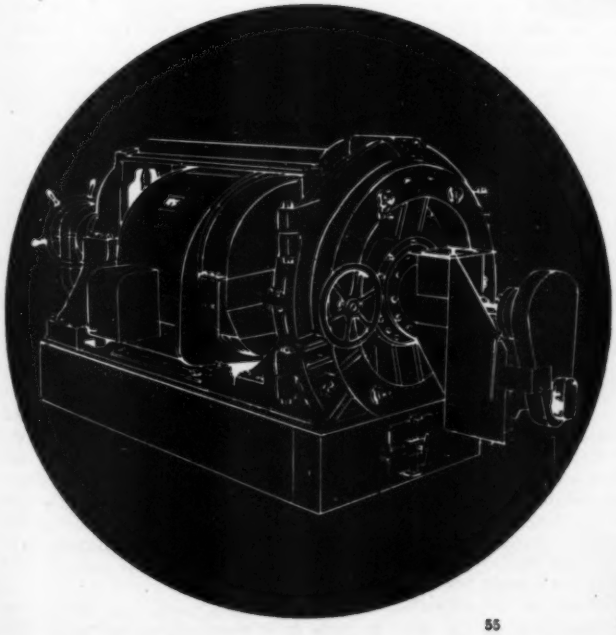

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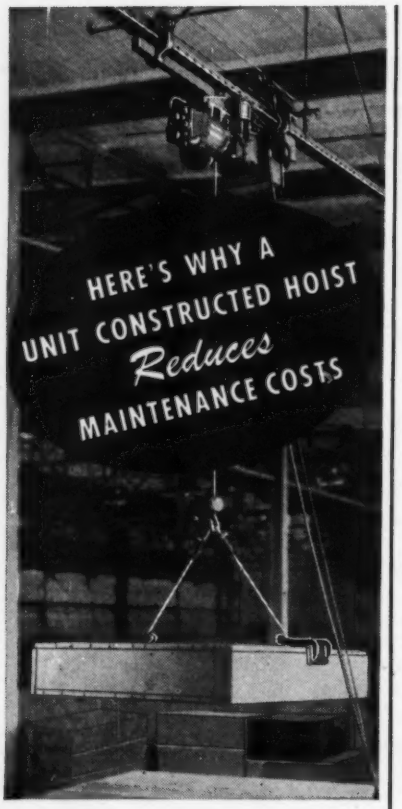

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The Technical Association and the American Paper and Pulp Association*

E. W. TINKER, Executive Secretary
American Paper and Pulp Association

You represent a very large group in the industry and a powerful influence—powerful, not only because of the high intellectual capacity of the technical personnel, but from a numerical standpoint. I do not question your individual interest in the welfare of the industry and its economic as well as its technical progress, and I would like to lay before you some of the current, non-technical problems of the industry and some of the technical problems beyond those involved in the operation of a paper mill.

First, I would like to discuss the peculiar financial history of the industry which has been the cause of much public-misunderstanding and certainly some basic misconceptions in financial circles. The pulp and paper industry has the reputation of being a feast or famine industry. The facts do not bear out this conclusion. Without going into detailed figures, I am prepared to state and, if necessary demonstrate, that from the standpoint of financial returns, the industry has ranked above the average in its stability. The very size of the investments required, the highest per worker unit of any industry in the country, has necessitated careful planning for permanence. Chronically, highly competitive in character, returns on capital invested in the industry have never been spectacular but, on the other hand, even in periods of depression, the industry has maintained a relatively favorable position when compared with other major industries, such as steel, textiles, and lumber.

In passing, I cannot refrain from commenting upon a recent unfortunate episode that indicates the degree of sensitivity of the industry to loose and unjustified statements. The August report of the Department of Commerce, covering the pulp and paper industry, contained a statement to the effect that the pulp and paper industry was curtailing production in order to maintain prices. This statement commanded almost national attention and was accepted as factual when the truth was that week for week the production in 1948 had exceeded that of 1947.

I mention the above incident because of the impact it had upon an industry that employs about a half a million people in its operations and indirectly provides employment for 624,000 people in dependent industries; an industry whose freight bill alone amounts to half a billion dollars, or some 7 per cent of the total for the nation; an industry that pays 300 million dollars a year in taxes and yet its welfare can be materially affected by unfavorable publicity based upon carelessly drawn conclusions.

The fact of the matter is that the fundamental economic position of the industry is such that, based upon almost inevitable trends over the next ten or twenty years, the pulp and paper industry should be in a relatively favorable position. Looking upon the domestic market alone, it is quite obvious that the increase in population, which has been very large, will to all intent and purposes absorb the output of new capacity, particularly if the increased per capita consumption of paper, which is now approaching 350 pounds per individual, is taken into consideration. After all, the use of paper is basically dependent upon the standard of living of the people. It is an important element in our educational and cultural life, as well as the sanitary standards that we maintain. It is true that a slump in general business activities would temporarily place the industry at a disadvantage, but, nevertheless, the demand for paper in the United States, unless we are to go into a social and economic tailspin, will inevitably increase.

I would like to say just a word about the foreign market. The paper industry has never exported more than 2½ per cent of its production. From a world standpoint, there is a rather definite limit on the possibilities of paper production because of the lack of basic raw materials, particularly wood. It is my personal belief that as the standards of living of the world's people gradually increase, there is an enormous potential demand which, to a considerable extent, must be supplied by the domestic industry. By way of illustration, let me recite the situation in the Republic of Mexico. At the moment, in spite of all the talk about the Reciprocal Trade program, Mexico maintains a protective tariff that is prohibitive and at the same time only the rich can afford the most basic necessities of life from the standpoint of paper usage. If all of our gyrations in the international trade field mean anything, such situations as this cannot long exist and the 20 million people in the Republic of Mexico will have available to them paper supplies at prices they can afford to pay.

I could talk to you a long time about some of the basic economic factors that influence the future of the pulp and paper industry and, more pointedly, I could talk to you with regard to immediate problems with which the industry is faced in connection with various governmental moves, including the National Defense program, but I do not want to detain you too long.

Because you represent the Technical Association, I would like to speak of a field of research, basic to the welfare of the pulp and paper industry which, in my judgment, has not been adequately explored. As you well know, the pulp and paper industry is dependent upon wood fiber as a basic raw material. Various public agencies have for many years been conducting research in the field of the growth of wood and its use. However, as compared with the techniques that have been developed in the manufacture of paper, in manufacturing institutions, the results have been crude and indefinite. I can think of no better illustration of the efficacy of research sponsored by private initiative as contrasted to research on the part of public agencies, than this situation illustrates. In time it is inevitable that the production of

(*) Paper given before the Metropolitan Group of the Empire State Section of TAPPI, in New York City, September 14, 1948.

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wood will be controlled by techniques that will guarantee maximum production not only from the standpoint of volume, but from the standpoint of material adapted to most economic use. The time will come when manufacturing institutions using cellulose as a raw material will be able to draw this raw material from wood grown under controlled conditions, because the species will be adapted to the environment.

The vast losses that we now are incurring because of damage by insects and disease, both of which are certainly controllable, with the ingenuity of man, will be overcome. In the completely integrated setup of a paper manufacturing unit of the future, I predict that technical developments in the production of wood as a raw material will rank with the developments in the processing of this raw material. I would solicit the interest of the Technical Association in pressing for advancement along these lines.

Engineering Pulpwood Production*

E. E. ESGATE, Consultant

▶▶▶ The Pulpwood Industry in the United States and Canada is currently producing raw material for the pulp and paper industry at the rate of some 29 million cords annually. The value of the pulpwood consumed by the mills exceeds 450 millions of dollars annually, or 1¼ million dollars per day. The direct labor cost of producing and handling the wood exceeds 600 thousand dollars per day, primarily due to high labor-consuming methods and techniques of operation. By comparison, the laborer employed in the pulpwood industry is required to work more seasonally and to perform many more back-breaking tasks than is his counterpart in many other industries. There are two excellent reasons for the development of improved methods of operation: First, to stabilize the supply of pulpwood; second, to reduce the cost of production in many days of effort per cord.

Seasonal production with the accompanying fluctuation from short-supply to over-supply and the ever increasing costs of production are of vital concern to the consumers. Mill management supports industry-wide programs of several Associations that are directed toward improving forestry and cutting practices, strengthening forest management and devising new techniques of operation.

The pulpwood producers see the "handwriting on the wall" and realize that the termination of the current "honeymoon" will necessitate the application of more efficient methods, to obtain a reasonable profit for the producer. The dependency of the industry on manual labor; the high cost of production in terms of man days of effort per cord; and the opportunity that is now presented to improve methods of operation are factors that are most clearly apparent. The producers have prime interest in the stabilization of pulpwood supply and are demonstrating that interest by action toward devising improved methods and equipment.

The equipment manufacturers are demonstrating their interest in the pulpwood industry by co-operating and assisting in the development of machines and operating techniques. The equipment manufacturers are becoming increasingly aware of the potential market that lies within the pulpwood industry.

Objective consideration of the interests attributed to those concerned with the stabilization of pulpwood supply should be followed by study of the restrictions and obstacles that affect progress.

Mill management is restricted to some extent by a strong and proper desire to avoid company-financed operations, observing the fact that an independent contractor can usually produce pulpwood cheaper and more efficiently. Those representatives of mill management who view the situation objectively recognize that improved methods of operation are of vital interest to the pulpwood consumer, the source from which the money must come, either directly or indirectly, to support the development of improved methods and equipment. Some take a short-sighted view in that they consider any help given the pulpwood producer merely increases his profit and gain by reducing his operating costs—without an immediate reduction in the price paid for wood. Mill management is also somewhat restricted by a division in responsibility for the handling of the wood, from a technical and administrative standpoint. The mill organization of many paper manufacturers is responsible for millyard operations, the woodlands organization being responsible for the production and transportation of the wood to the mill yard. This situation complicates the determination of an effective compromise with respect to the dimensions of wood found to be most suitable for processing and those most suitable for handling, transport and storage.

The independent producer is generally restricted by financial limitations with respect to the purchase of high-capacity labor-saving machines. Frequently his total annual production is insufficient to warrant the purchase and application of material-handling equipment capable of handling the pulpwood in quantity. When he observes the extensive use of manual labor in the operations of the consuming company to which he delivers his pulpwood, he may rightfully consider that there is some "catch" to the use of machines. As a consequence, he follows the procedure that requires the lowest capital expenditure and depends on an increase in the delivered price for pulpwood to meet his constantly increasing labor costs.

The equipment manufacturers have gained confidence in the programs of the Pulpwood Industry and are reactively supporting the development of improved methods. They are restricted to a great extent by lack of knowledge regarding the specific functions required to produce pulpwood through the use of machines that are presently available. There is an understanding in some quarters that "special" machines are required to cut, handle and transport pulpwood. The current status of raw-material supply, market and productive capacity for the manufacture of equipment is not conducive to the production of "special" machines. The equipment manufacturers are definitely interested in adapting standard equipment for special applications.

It is generally agreed that major improvement must come through wider use of machines, to increase the productivity of labor. Mechanization can be likened to religion, in that almost everyone talks about it; recognizes its applicability; pays lip service to the preacher; but few do enough about it. The tendency is to do either too little or too much, depending on the enthusiasm of the individual and the urgency of breaking a bottleneck. Action taken under pressure is frequently expensive and relatively non-productive of the desired result. For that reason, if for no other, now is the time to plan and carry out an evolution of improved practices that will solve some of the problems confronting the Pulpwood Industry.

The growth of timber is being planned and engineered to a greater extent at this time than ever before, through the efforts of experienced foresters, many in the employ of the consuming companies. Government edicts and regulations provide an incentive for these efforts, to supplement any altruistic interest that may be present. Company owned forest lands are being developed for sustained yield. The operations

(*) Paper given before the summer meeting of the Canadian Pulp and Paper Association—Woodlands Section, August 18 to 20, 1948, at St. Johns, Quebec.

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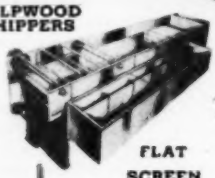

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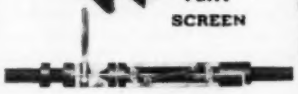

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required to harvest the crop and deliver the pulpwood to the mill can be equally well planned and executed. The most important of the basic operations required can be classified as "material-handling" and "transportation." The evolution of efficient methods of operation can "happen" or it can be engineered.

An engineer's approach to the operational problems confronting the Pulpwood Industry involves analysis to ascertain the factors that restrict and limit the operating efficiency of labor and machines. Study indicates that *volume* should be given first consideration.

At the source we are concerned with quantities as low as three cords spread over an area of one acre. After the piece maker's phase of the operation is completed we have piles of one cord and larger to handle but the area over which these piles are dispersed is not changed. At landings and concentration yards we find quantities up to several hundred cords, the wood having been concentrated for handling and shipment. At railheads and mill yards several hundred cords of wood are handled daily. The methods and equipment to be employed in the various phases of pulpwood production should vary and progress in accordance with the volume to be produced and handled.

Manual labor is the most effective means presently available to handle the small volume represented by individual sticks of pulpwood at the stump, to concentrate the wood from several trees into one pile. From that point on the wood can be handled mechanically, in quantities of a cord or so at a time, more effectively than by individual sticks. The limiting factor in the use of a machine in this application is the volume to be handled at any one location, or with any one machine. The employment of manual labor in the handling of a large volume of pulpwood at any one location is probably the most expensive method of operation that can be applied. It is being done every day in the pulpwood industry.

To illustrate common procedures, consider the operation of the small producer. His laborers fell and buck-up the trees, pile the sticks near the stumps and rehandle the wood to place it on drays, scoots or trucks. Some of the wood is transported direct from the stump to the railheads, or to the mill, on trucks but much of it is drayed or scooted to a roadside landing where it is rehandled and piled in ricks of several cords. At a later date the laborers and truck drivers load this wood, by hand, on trucks for delivery to the railhead. At that point the wood is again rehandled, by hand, to rail cars for delivery to the mill. A considerable quantity of wood is unloaded by hand from rail cars at the mill.

Other producers operate tractors and sulkys to concentrate the pulpwood at a landing, thus avoiding rehandling at the stump. After the tree lengths are cut up, much of the wood is either loaded on trucks, by hand, or piled in ricks for later loading. A few major producers are using aerial logging equipment to further reduce the manhandling of wood.

There are an inestimable number of variations in operating procedure but the incidence of rehandling by manual labor generally applies, even on operations involving volumes that warrant the use of equipment. Perhaps the most flagrant examples are the operations at railheads, barge landings, and mill yards, where hundreds of cords of wood are handled manually each day, by laborers and truck drivers employed by several producers. The installation of a mechanical means of unloading trucks would reduce the unloading time by up to 80 per cent and consequently increase the number of trips that a truck could make between the landing and destination during a given period of time. This inefficiency is paid for by the purchaser of the wood.

It becomes apparent that volume should determine the type and size of the equipment to be utilized in the production, handling and transport of pulpwood. Volume is a factor that can be controlled through planning and coordination of the several phases involved in the process of delivering a cord of pulpwood to the mill. The effective employment of machines and a consequent saving in costs of operation requires engineering and planning of individual operations to provide the most effective balance between volume and capital expenditure; and, at the same time, an understanding of how to properly apply and operate the machine.

Specialization has proven to be an effective cost-saver in many industries. The small producer is concerned with logging operations; material-handling operations; trucking operations and maintenance. He is frequently less than well informed with respect to the capabilities of equipment and is confronted with small volume in each function. If one specialist in transport could contract for the hauling of the pulpwood produced by ten small producers, the volume would warrant the use of heavy-duty and high-capacity equipment to result in lower operating costs. The logging of a number of small woodlots would, in many instances, develop sufficient volume to warrant the use of equipment in lieu of manual labor.

Consideration of the situation from the viewpoint of an engineer indicates the applicability of a principal-contractor system, to be developed through the mutual efforts of mill management; the producers and the equipment manufacturers. Suggested actions to be taken in this regard are:

1) Complement the professional advice and assistance given the pulpwood producers by the company-employed forester with engineering assistance, to be utilized in planning and executing production operations.

2) Revise the methods of railhead, landing and millyard operation to provide for the maximum use of mechanical aids in material handling.

3) Develop principal contractors for the handling and transport of pulpwood between landings or concentration yards and the mills.

4) Develop principal contractors for the logging operations from the stump to the landing or concentration yard.

5) Develop, through independent contractors or initially with direct employees of the consuming company, a "milk-run" system that will provide for the small woodlot owner or operator to harvest his crop and make the pulpwood available to the purchaser at the roadside. The loading, transport and unloading of the pulpwood from such sources could be the responsibility of the consuming company direct, or through its principal transportation contractor. Mobile equipment, including heavy-duty trucks and motorized cranes could be profitably utilized by a contractor to pick up and deliver the pulpwood from several small producers, at a cost far below that required to handle the wood manually and transport it on small, overloaded trucks. The individual wood lot owner might find it profitable to utilize inexpensive power operated equipment such as small tractors and power driven saws.

6) Prepare in advance, for all operations

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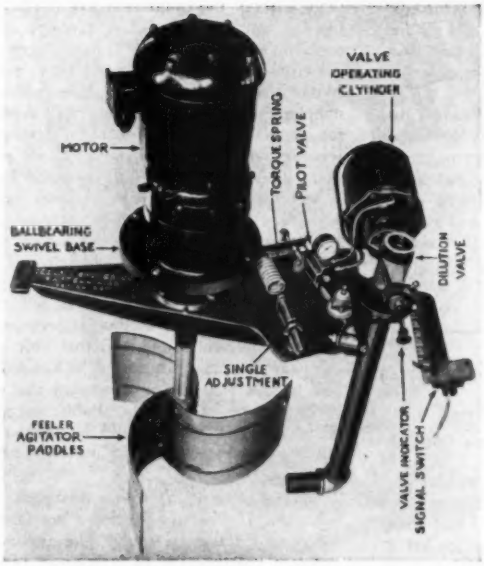

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and particularly those to be conducted on large tracts of timber, a detailed plan of operation based on the volume involved and the duration of the job. Such a plan should provide for mechanization of those phases that can be profitably mechanized, the machines to be selected with respect to individual and related capacities, convertability, flexibility and initial cost. Variations in methods to be applied should be predicated on volume, topography, cutting practice, weather, skilled labor availability and supervision. The execution of such a plan might be conducted by principal contractors or company-employed personnel.

Under this procedure the purchaser of the pulpwood could stabilize and increase control over the flow of wood to his mill. He would be paying for services rendered by his own properly trained and supervised personnel; transportation experts employed and supervised by an independent contractor; logging experts employed and supervised by an independent contractor; and a limited number of manual laborers working for small independent woodlot owners. Engineering advice and assistance furnished by the company-employed engineer and by the equipment manufacturers would be available, thus assuring maximum efficiency and reasonable costs.

The diversity of problems confronting the producers of pulpwood prohibits the broad application of any single producer or method on a nation-wide basis, without some variation or modification. The basic engineering principles of proportion and balance can be applied, however, and will assist in the development of methods and equipment to stabilize pulpwood supply.

Putting Waste Wood to Work

EDGAR L. HEERMANCE
Northeastern Wood Utilization Council

▶▶▶ ABOUT SIXTY MEN gathered at the Massachusetts Institute of Technology, under the auspices of the Northeastern Wood Utilization Council, to discuss one of the problems of the pulp and paper industry: what to do with the steady accumulation of waste bark. Trees contain from 10 to 15 per cent of bark, which ordinarily cannot be used for pulping, which constitutes the largest waste in industry. The attendance was definitely limited. Pulp mills in the area were asked to send representatives; others came by invitation, because they expressed interest in the special topic to be discussed. Experts in their various fields were asked to present papers, which later will be published in full, but the rule is that they must merely summarize these as a basis for question and discussion. Three previous conferences of this type have been organized by the Council, at the University of Maine on wood products for fertilizer, at the New York State College of Forestry on new developments in hardwood pulp, and at Yale on lignin chemistry and utilization. This stimulating informality was an outgrowth of the Council's own quarterly meetings, where the active members and staff sit around a table and report confidentially on work in progress.

The Northeastern Wood Utilization Council is a unique body in many ways. For one thing it concentrates on a particular job: the promotion of new uses, not for wood in general but for low-grade wood and wood waste. The Council regards this as the key to good forestry, a view that is coming to be widely accepted. America is passing through the transition from the idea of woodland as a mine, to be stripped and then abandoned, to woodland as a crop, to be handled for continuous yield. Just as a garden is carefully weeded to secure the best results, so rapid growth of timber and high quality depend on improvement cuttings. These will not be made unless there is a sale for the material that is taken out, which is low-grade wood. Hence the importance of this neglected problem, which the council has set itself to solve.

Again, the Council concentrates on a particular area. Instead of aiming at a national movement, with a large and perhaps top-heavy staff, it prefers to be a small, flexible organization, confining its effort to a limited region. In such a region, men are more or less acquainted with one another and can get together rather easily. They face common problems. Incidentally, the Northeast has a higher percentage of land in forest than any other section of the United States, and perhaps the lowest level of forestry practice, due in part to the multiplicity of ownership. Nowhere is the problem of utilizing low-grade wood material more acute. What the Council may work out for the Northeast is, of course, available for other parts of the country, and of the world for that matter. Through a corresponding membership, its technical bulletins now go out from the office in New Haven to every continent. The weakness of an unendowed nonprofit corporation is that it must depend for support on companies and individuals who recognize the importance of its program. This is perhaps a strength rather than a weakness, for to survive it must make good. The Council is an independent agency, free from Government subsidies and bureaucratic control. It has nothing to sell, and no fees are charged. The sole interest is to put low-grade wood to use. If it is felt that some new product or method is technically and economically sound and that only one company can make use of it, the Council is free to offer it to the best company that can be located for the purpose. Public agencies cannot do that; they would be subject to criticism, investigation and probable head-chopping.

Technical research is not attempted. To undertake that would require a big laboratory and a staff of experts. The aim is to promote practical use. The findings of the great U.S. Forest Products Laboratory in Wisconsin, and similar agencies, are of no value until they can be trapslated into local wood-using plants. The Council has developed an almost uncanny skill at discovering new utilization possibilities in this country or abroad, and finding companies or other agencies that are enough interested to do the pilot plant work that may be needed, without cost.

What has been accomplished, after six years of intensive work? In a co-operative movement of this sort, sharing effort and credit with many agencies, that is not easy to appraise. Applied research is like mining, where every lead must be followed up, but only a few will show rich ore. What looks like perfectly good business opportunities in the utilization field may lie on the shelf because they do not reach the attention of the necessary venture capital. Officials of one large plastics corporation, discussing their problems with the Council's Technical director, were advised to put in their own

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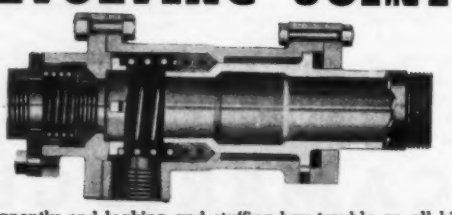

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wood flour plant, instead of buying from outside sources. This was done, but it is doubtful whether the top men in the corporation know where the suggestion came from.

Much attention has been given to problems concerning the pulp and paper industry, which bulks large in the Northeast, and is the greatest potential outlet for low-grade wood. The Council detected the growing shortage of spruce. and has been helping to speed up the necessary shift to hardwood for pulp. Tests were arranged at the Herty Laboratories on the pulping of oak, a practically untouched source of pulpwood, by the neutral semi-chemical sulfite process; a successful method was developed for recovering chemicals from the waste liquor, thus avoiding stream pollution if new pulp mills were established to use this process. A good deal has been done on the utilization of sulphite waste. The Council is now exploring certain possibilities of pulpwood supply from the scrap in woodworking plants. An entirely new method of pulping, which looks extremely promising, was discovered in Italy. That is why the men on the staff of the Northeastern Wood Utilization Council find their work so exciting. They never know what they may find next.

Convention Papers . . . Abridged

Cost Reduction in Stock Preparation

CHARLES MUZZY
E. D. Jones & Sons Company

Abridgments in this section are from papers presented at the Northeastern Division of the American Pulp and Paper Mill Superintendents Association, held at Poland Springs, Maine, September 23-25, 1948.

The cost of the preparation of paper stock varies over a wide range in the many different types of mills. It has been estimated that a range of from 5% to as much as 75% of the total cost of paper production exists. In such a range as this there is plenty of room in which to improve operating methods and systems, and thus make substantial cost reductions in one of the important phases of paper production in which there is much general interest among papermakers of all kinds.

To the operators of a few mills there isn't much that can be said, because they, at least for a time, have done everything possible to produce records of fine operating efficiency, and until something unknown at the present comes along in the way of new materials, new processes, or equipment, they can retain a much-envied position in the industry.

There probably remains, however, outside of this group of mills a much larger one consisting of mills in which work in the reduction of operating costs could be carried on to real advantage.

In many of these mills reduction in costs derived from labor, power usage, and maintenance of equipment no doubt could be accomplished. It is hoped that by enumerating several cases where steps have been taken, bringing about actual improvement in costs, that someone may benefit his mill from an idea that has already helped somewhere else.

Without doubt the two largest cost-producing factors in stock preparation are labor and power, and the following cases show how some mills have been able to make savings in these factors.

A mill making high-grade book paper found it necessary to replace three old Jordans in the refining system. The new installation was made with two modern Jordans, equipped with specially designed fillings. The new equipment does a better job on the same amount of stock and at a saving of one-third of the previous horsepower.

Another mill making sulphite and kraft specialties replaced two old Jordans with a single new unit in which the filling was made for the particular job. The mill reports that the new Jordan is doing an outstanding job of refining and uses a maximum of 152 hp, which is about one-half of the power required by the old Jordans.

Improved efficiency was accomplished in a mill making kraft bag paper by the use of a new design of filling two large beaterroom Jordans. In this case the exisiting Jordans were equipped with new plugs and special fillings at nominal cost. Here, the improved efficiency came from greater production for the same horsepower expended. Machine speeds were increased by a freer stock condition, resulting from the better refining action of the new fillings.

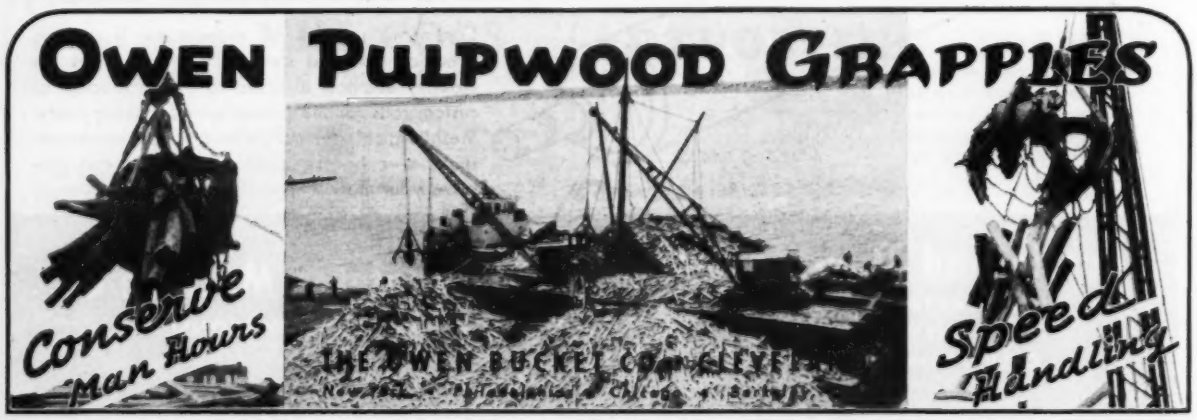
The same effect was reported from a mill making a sulphite bond sheet. A new 350-hp Jordan replaced two old units, and produced a freer but well-developed stock, making possible higher machine speeds with increased production figures. This report also showed that the refining power had been cut in half, and that the new Jordan would pay for itself in about a year's time.

These four cases, to which many others could be added, demonstrate how, in the Jordan field alone, appreciable savings in costs can be effected by the proper application of equipment. In addition to the selection of the proper size of a well-built modern Jordan, it is evident that the choice of the filling in that Jordan is perhaps of first importance, as it is the bars in the plug and the shell that actually do the work.

It is interesting to note that in the two last cases given, fiber development was accomplished at higher freeness levels, making possible greater machine speeds. The fillings in these Jordans that are responsible for this type of treatment follow the recent and successful trend away from conventional wide bars to narrow ones, very closely spaced.

Such savings as these cases show may vary over a wide range, of course, depending on power costs at the individual mill, but when a Jordan can pay for itself in a year, or another one can save six to eight thousand dollars in the same time, we are made to realize how much might be gained in this way in some of our mills where old and outdated equipment is still in use.

Many mills are still using beaters for stock refinement, and it is interesting to note how in one of these a high degree of efficiency in its stock preparation system has been built up. This mill is a rag mill in which the furnish varies from all rag to all sulphite pulps. The rag half stock is delivered to the beater room in lap form from a wet machine. In the beater room the various pulp mixtures for two machines are slushed in a few minutes to a 5% consistency in a tile lined pulper, and then pumped into one of two 1500-lb. stainless steel beaters in a matter of three or four minutes.



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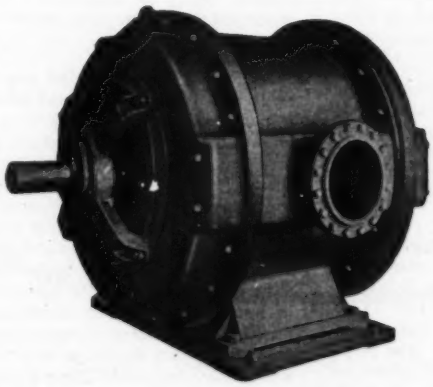

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These beaters are equipped with large heavy rolls filled with closely spaced bars, which operate against three specially designed bedplates. The beaters operate automatically with a pneumatic control system. Because of the high efficiency of these beaters some stocks are treated for as little as ten minutes, compared with ninety minutes required in the old multiple beater arrangement. In this system, one of the greatest savings in cost comes from a real reduction in labor, as the number of men per tour is now only half as many as was formerly required. Besides an improved quality of product, saving of space, and reduction in maintenance costs, other savings have also been effected by the system. A 30 to 40% reduction in beating power per ton is reported, and because of a more complete fiber treatment, only half as much work is required from the Jordans.

In another rag mill the improvement program was started back in the washing department. A large 6000-lb. two-roll rag washer was installed on the floor below the cooking boilers. This washer consists of a 50-ft. tub of steel-reinforced concrete, with white tile lining. There is in each channel a large automatically controlled roll and an all-stainless steel cylinder washer electrically driven and hydraulically raised and lowered. Cooked rags are shovelled through holes in the floor into two large sluice pipes leading to the washer. At the end of the washing cycle the charge is dropped through hydraulically operated valves to storage chests in the basement. The half stock is then pumped to the beaters as required. It can be seen that the labor required for handling material has been greatly reduced in this system, and it is believed (although actual figures are not available as yet) that an appreciable reduction in power costs per ton has been brought about through the efficiency of the new washer.

Efficient, cost-saving beater systems can be built up by the use of automatic controls as was done in a large kraft mill. In this beater room there are four large triple bedplate beaters automatically controlled. The entire production of about 250 tons per day from this carefully planned system is controlled by only one operator. The beaters are filled with slush stock from the pulp mill by opening a hydraulic valve and starting a pump from a remote control point. The beater roll is set and manipulated automatically, and size and alum are added from measuring tanks overhead. At the end of the short beating cycle the operator opens the dump valve and flushes the beater with water from remotely controlled valves. This operator is a busy man, but when we compare this system with most beater rooms, the resulting difference in labor costs is quite evident.

It may be said that in these systems that real money has been invested to accomplish the fine results reported, but in most cases the need has been felt for real progress in order to stay in business and to be ready when conditions are not as good as they are today.

It is not always necessary to spend large sums of money to bring about better and more efficient conditions in the beater room. One quite inexpensive method of improving the performance of a beater would be to set up a better maintenance program. Many mills are finding that it pays in terms of improved beater efficiency to spend more care in their upkeep. By maintaining the condition of the roll bars, the bedplates, the bearings, drives, etc., the beater will produce more stock for less power and might not be such a bad piece of machinery after all.

Feeding a beater with slush stock from a good pulper is one way to get more and, less expensive, performance from existing as well as new equipment. Tackle will stay in better shape for a much longer time and the beater can be making stock for a larger percentage of the time available.

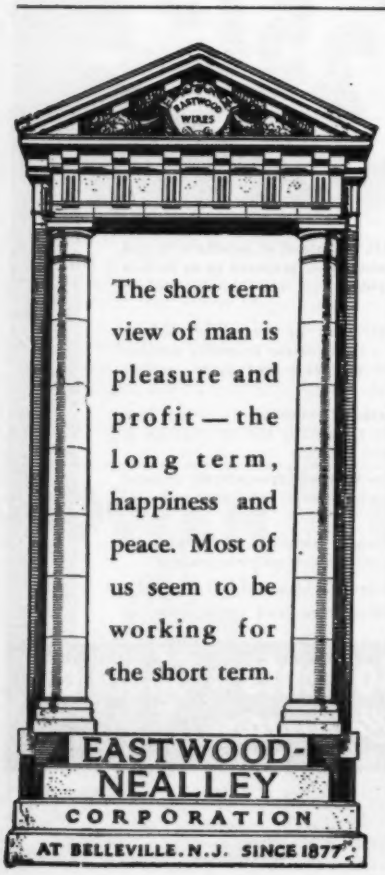
Beaters can sometimes be supplemented with refiners to advantage. For example, a mill making a high gade electrical insulating board from rag fiber installed two 75-hp refiners to replace some of its beaters and complete the refining treatment. The preparation of the fiber was formerly carried on in six Hollander Beaters, in which the stock was treated for four hours. With the new system it was found that two of the existing beaters were sufficient to treat the fiber through the first stages of refinement and the necessary treatment was completed in the refiners. The combination of beaters and refiners in this mill produced very substantial savings in power per ton of product.

Similar results were obtained in a cigarette mill using flax as a raw material. Here the half stock required nine hours of treatment in regular beaters to produce the necessary characteristics. The same characteristics were produced in a new system including the use of two specially equipped refiners set up in series. The refiners supplemented the former beating equipment to the extent that only two hours were required in the beaters. Careful analysis of this system indicated a power saving that amounted to $6.00 per ton and with a production of ten tons per day, it can be seen that it wouldn't take very long to pay off the cost of the new equipment.

These small, high-speed refiners are used in many mills and on all kinds of stock, producing real savings in power and maintenance costs. One recent installation of this type of machine was made in a board mill where a refiner is used on each cylinder of a seven-cylinder machine. The refiners here are, of course, part of a stock preparation system that in some respects is unique and certainly very efficient. The wastepaper material for the filler stock is slushed in another pulper, ready for refining. It is reported that the horsepower for this entire mill system is about the same as that required by only the Jordans in other mills of equal size.

In some of the previously mentioned cases the use of pulpers has been shown to reduce costs in stock preparation systems. In concluding this study, a report on the performance of a pulper of new and unique design will show how this type of machine actually will save costs in several ways. This particular pulper was installed in a mill to replace three existing beaters. It consists of a rather deep tank of oval shape with hopper shaped bottom and flat top providing pulp entrance. A rotor, which looks like two cones with the small ends together at the center, is mounted on a horizontal shaft near the bottom of the tank. Projecting bars on the rotor cause the stock to circulate toward the outer ends where it is then rubbed by the action of heavy steel arms against adjustable discs, thus producing a two-stage disintegrating action. The pulper operates briefly as follows:

A 2,000-lb charge of baled pulp is made ready on a roller conveyor and white water is pumped into pulper tank to a definite level. Clay, size, alum, and starch in measured amounts are made ready for quick charging. In three minutes' time the pulp and other ingredients are dropped in and the batch is treated for twenty minute period. The stock is then completely de-fibered and ready to drop to the beater chest. Reports from this installation indicate savings in costs of labor, power, maintenance, and material. The number of men to handle material and operate the pulper is two less than was formerly required. There is a reduction of 75 connected horsepower from the three beaters to the 100-hp pulper motor. Because of an improved mixing and blending of the fibers with clay, starch, size and alum, a definite reduction in amount of these materials has taken place. An estimate of the total savings made possible by the use of this pulper is something better than $11,000 a year, or, in this case, a reduction in cost per ton of paper of about $1.10. This does not include savings in maintenance costs, as these figures are not yet available, but it is felt that because of the nature of the pulper in comparison to the beaters that this item would be quite substantially reduced.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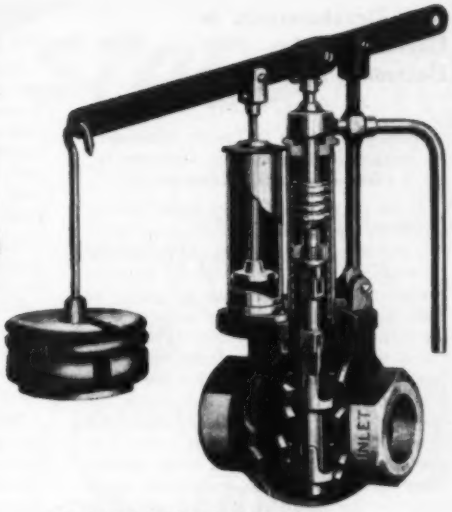

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New Developments in Electrical and Electronic Applications

G. W. KNAPP

Manager, Paper & Textile Division
Industrial Engineering Divisions
General Electric Company

At the outset, I believe the paper industry should be congratulated for its progressiveness and continuing search for improvement. In working on the application of electrical equipment to manufacturing processes, we come in contact with many industries. In my particular case, I have been largely associated with the paper industry, but have spent some years working with a few others. The attitude of the paper industry is outstanding in this respect. Your industry has a spirit to do better, which is matched by few others. This has resulted in the development of the finest type of electrical equipment for the industry, with the use of the most modern electrical techniques.

Such a situation is reflected in steady, substantial increases in operating efficiency, and the productivity of your working force and plant for better costs per ton. I believe we can look forward to even more progress and at an even faster rate, thru new developments in electrical and electronic applications.

What kind of electrical equipment does the industry need? Where can a better job be done?

First, your electrical equipment must be reliable—even more so than it is at present. The output of a single paper machine nowadays may be worth $30,000 a day or more.

Second, you are interested in performance and control, for cost reduction. Control must be automatic; or it must regulate speed or tension; or it must accelerate and decelerate rapidly. You want these things for high production to increase the productivity of your working force and machines, to get lower costs.

Third, you want the least maintenance, consistent with the job the equipment must do. Maintenance labor is expensive, and becoming increasingly important as more automatic processing is achieved. For example, in oil refineries one of our most automatic industries, there is one maintenance worker for each production worker.

Your present electrical equipment is doing an excellent job of reliability and performance with low maintenance, but new developments are making electrical apparatus even better.

With the most modern equipment, the performance requirement is attained thru the use of brain units such as electronics, rotating machines like amplidynes, rototrol, etc. The use of these devices, in combination with better materials and manufacturing techniques, also helps us to do an even better job of reliability and low maintenance. In addition to satisfying these basic requirements for paper mill service, the equipment will be safer, cleaner, easier to work on, and more attractive in appearance.

With this general background, suppose we examine drives and equipment which include these new developments, to see specifically how they meet your requirements.

Paper Machine Drives

Paper machines drives are one of the most important and fascinating jobs in the mill. As you gentlemen know, in the past 25 years paper machine output on many grades and weights has been doubled, and more. This has been accomplished by higher speeds and wider machines. Some tissue machines are in operation today at speeds approaching 2500 fpm experimentally. Kraft and news machines are being designed for top speeds of 2000 fpm. When you are ready for higher speeds and wider machines, we will be able to give you the drives.

As you know, there are two basic types of paper machine drives, the lineshaft drive and the sectional drive. The lineshaft may be driven by a steam turbine or an electric motor. With the sectional drive, a *separate* motor is used for each section of the machine, synchronized through electrical control means.

The sectional drive is, we believe, more accurate in holding draws; more adaptable in the type of draw control, permitting tension as well as speed control to be used; is easier for the machine tenders to operate; takes less space and is more flexible in arrangement. On the other hand, it is more difficult to understand and may have more component parts.

The lineshaft drive is simpler, easier to understand, and does a good job of holding draws, except, we believe, where critical machine coating operations are involved, or where heavy calendering tensions may be used, as on board machines.

In previous years, many people in the paper industry felt that the lineshaft drive should be used on smaller machines, where it costs less than the sectional drive, and where draws were not so critical. For larger, high speed machines, the sectional drive was considered to be superior because of its accurate draw control, and because its first cost became less than the lineshaft as machine widths and speeds increased.

Today the situation has been changed considerably because electrical equipment has not increased in price as much as the mechanical equipment of the lineshaft drive. Purchasers frequently find the sectional drive cheaper even on small, slow speed pulp machines.

The electrical industry cannot firmly recommend either type of drive, because the requirements and situations in your mills differ widely. However, as your chairman suggested to me, we can give you the facts as we see them, to help you decide.

Sectional Drives: Suppose we briefly review what makes up a modern *sectional* drive with the latest electric and electronic developments included in it. In our case, we have developed and have standardized on, a sectional drive with a new power system and new control. We call it, the multiple generator drive with electronic-amplidyne control. An imposing title, but it has meant actually considerable equipment simplification. We have built and are building about 30 of these multiple generator, sectional drives.

The power system of the multiple generator drive employs an individual generator

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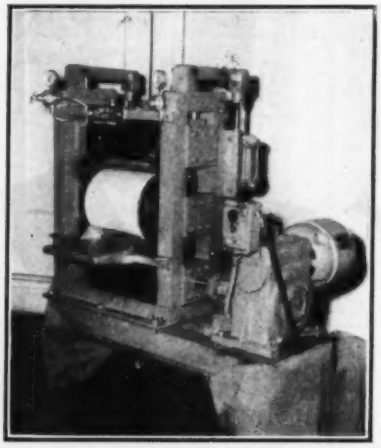

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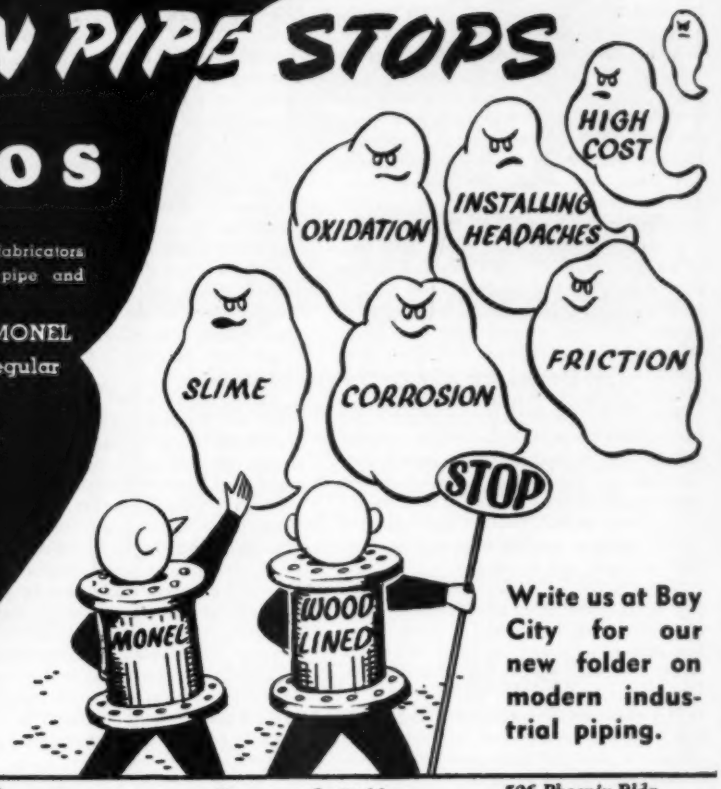

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for each section motor. This has a lot of advantages both to performance and simplification.

In paper machine operation, we have the problem of having to start or stop sections separately. With the single generator type of drive, which was quite standard until 1946, and where one common generator supplied power to the section motors, special control was required to permit us to meet the individual starting and stopping requirements. An additional starting generator was also required. By using a separate, individual generator for each section of the paper machine, this has been eliminated. Thus we have traded rotating machinery for quite complicated control.

We have made another substantial gain. With the single generator system, the voltage applied to the terminals of the motors is the same and cannot be adjusted to take care of individual section speeds, for draw control and different loadings. Thus, it is necessary to use motor field control on each section for these purposes. With the multiple generator system, the individual motor voltage can be adjusted because each motor has its own generator. Voltage control is considerably superior to motor field control in regulating the speed of a motor, increasing substantially the speed regulator response to load changes.

Thus, by one fundamental power circuit change, the equipment was simplified considerably and performance improved.

The control system of the multiple generator drive uses the electronic amplidyne speed regulator which is a remarkable speed control combination; the same combination that was built in tens of thousands for turret control on bombers.

At each section, an electronic amplifier takes a very small speed error signal from a tachometer generator, driven by the section motor, amplifies it by a large amount, and feeds it into an amplidyne generator which is really a rotating power amplifier. The amplidyne supplies the generator field and therefore controls the generator voltage on the section motor for speed control. The same power and speed regulating control are used for each section of the machine.

There is no question that electronics and amplidynes are more difficult for the mill electrician to understand, but each section is a self-contained unit, divorced from the others except for the speed reference signal it gets. The repetitive sameness, section after section of the control, promotes understanding.

Furthermore, once the preliminary tuning up has been made by our engineers at the start-up, any wiring errors or faulty components eliminated, the drive stays in adjustment. We don't have trouble with electronic components, which are static and carry such small currents that they are several times oversize. The amplidyne in appearance is a conventional generator, and can be maintained that way. The problem of tube failure has been and is being solved successfully by periodic testing, much like that done in a radio store. A record is kept of each tube by testing it every month or so. When its output starts to go down, it is discarded and a new one put in. The tubes themselves are of the radio type and cost very little.

Thus, the maintenance problems are no more than with any electrical equipment and preventive maintenance, without losing the sheet, is possible and successful. This has been proved on the drives which have been in service since 1946. Commutators, bearings, relays, and cabling may require maintenance work, but the electronics go merrily along.

Each mill then must evaluate how much this kind of typical electrical maintenance means to it, based on its experience with other electrical equipment. The study should then embrace lineshaft maintenance such as the shafting itself, realignment if foundations settle, the wear and replacement of clutches and flat belts on cone pulleys.

In view of the foregoing, from the performance standpoint of holding draws, ease of operation, installation flexibility, and anticipated maintenance based on experience with other electrical equipment many mills are choosing sectional electric drives today.

There are also some fascinating *sidelights* on sectional drives and the way they lend themselves to various types of control.

In some cases, we have found that better draws between sections can be obtained by holding other quantities than the relative speeds between two sections. For example,

on heavier weights of paper (perhaps 50 lb. and higher, on a 3000 sq. ft. ream basis), we are now using tension control on calenders and reels. This tension control is provided by holding a constant torque output from the motor rather than a constant speed. Constant torque means a constant pull across the width of the sheet, or constant tension. Machine tenders like the operation it gives very much, less adjustment of draw rheostats is required, a better sheet goes into the calender, or a better roll is made at the reel.

In certain cases photoelectric controls may be used between sections. We are at the present time building such a control for the couch draw on a machine which is a special purpose machine, making only one grade and weight. It is expected that when it is started up no attention from the machine tenders will be required for this draw.

We are also supplying a sectional drive for a coated paper machine, where a supercalender will be used in tandem with it. The draw between the machine calender and the supercalender will be controlled by a photoelectric loop control, using a light beam to hold a constant loop between the two sections for speed synchronization.

Lineshaft Drives: When the choice is for a *lineshaft drive,* there are two types to be considered, turbine or electric motor drive. The turbine is usually arranged to exhaust to the dryers. Substantial refinements have been incorporated in each type.

The decision between them is largely based on heat balance and economics, and requires a study for each application. Generally, if sufficient low pressure steam is not available for the dryers on the paper machine, a turbine may look like the better choice. On the other hand, if the paper machine operates over a wide speed range, this may not be the case. Under such conditions, at low speeds, the horsepower to be supplied by the turbine, and therefore its exhaust steam for the dryers, will be down. The steam needed for drying actually may be as much or more than that required at top speed. Thus, considerable make-up steam will be needed and the turbine drive may not be justified.

There are new developments in the speed control of lineshaft drives. It is important that the speed of the lineshaft be regulated quite closely, not so accurately as for a sectional drive, but still in the order of ½ of 1 per cent.

The principal reason for doing this is to avoid changes in paper weight which might accompany speed variations. Secondly, with certain types of stock, variations in couch speed must be avoided to prevent flooding or seizing the wire. These can occur when sections of the machine are clutched in, particularly a large group of dryers. Third, if there are coating operations involved or other places where draws must be held very carefully, sudden changes in lineshaft speed can cause draw changes because of the tremendous differences in inertia which exist in a paper machine. Section drive belts do have slip and creep so that any rapid changes in load which would be caused by trying to keep the sections together can produce draw changes.

The speed regulator for the *turbine drive* is a combination electric-mechanical device. A tachometer generator is driven from the lineshaft to provide a speed measuring signal. Its output controls an electrically operated pilot valve which works on the hydraulic system of the main governor valve to control speed. This arrangement does an outstanding job. Under steady state conditions, it will hold speed with an error of less than 1/10 of 1 per cent.

The speed control equipment for the electric motor lineshaft drive is quite comparable to that used for a particular section of the multiple generator sectional drive. A tachometer generator, driven by the lineshaft motor, provides a small error signal to an electronic amplifier which, in turn, is used to excite an amplidyne exciter that controls the generator field, and hence, the voltage on the motor. This arrangement of course is highly accurate and will hold speed with an error of less than one-half per cent. In addition, the use of the amplidyne exciter has eliminated the need for a large, complicated motor-operated rheostat for the generator, so that a simplification in control is also obtained.

There is an added development of interest for lineshaft drives. As paper machine sizes increase and speeds go up, the large horsepower requirements for the paper machine sections impose a difficult job for lineshaft cone pulley drives, gearing, and clutches. This situation can be relieved considerably by the use of *helper motors* on certain sections. The section intake shaft, driven from the lineshaft, provides a good share of the power required (perhaps half) as well as the speed synchronizing means. The rest of the power comes from an electric motor whose torque output is regulated, by amplidyne control.

Let us review some typical applications of helper drives. For example, on press sections, a motor drive on the top roll may be used, while the bottom roll would be driven from the lineshaft. On dryers, additional indriving shafts may be provided for the electric motor drives, with the lineshaft drives coming into the dryers in the conventional way. For couch sections, the lineshaft drives through the low speed shaft of a gear reducer, while the motor is connected to the high speed shaft.

As you know, on large high speed machines *auxiliary couch* rolls are being used to facilitate removal of water and improve wire life. It is the usual practice to drive these from motors alone even when lineshaft drives are available. The motor load is controlled in accordance with the vacuum on the main couch roll. When this vacuum increases indicating a higher load because of friction on the wire, the motor driving the auxiliary couch is made to work harder by an amplidyne regulating scheme. Thus, the lineshaft drive for large high speed machines is really a combination electric sectional and mechanical lineshaft drive.

Supercalenders and Winders

Top speeds for supercalenders and winders have been steadily increased. To get the most out of these higher speeds, acceleration and deceleration must be rapid. Under these conditions, inertias become important and must be compensated for if sheet tension is to be maintained. For example, when ac-

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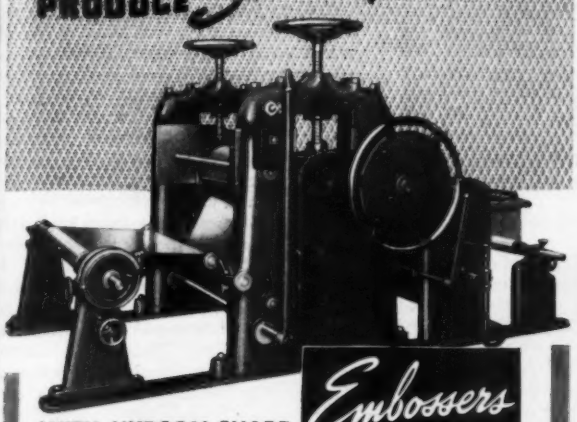

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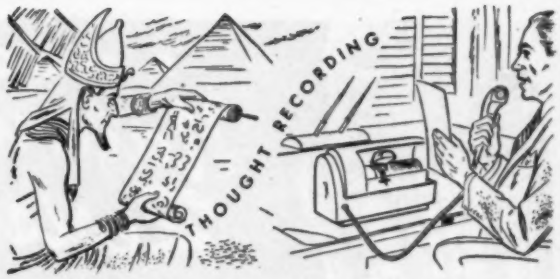

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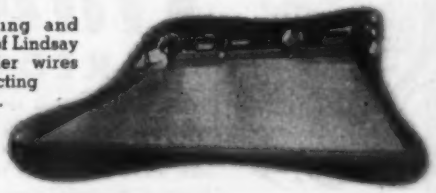

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celerating a supercalender, the roll of paper at the unwinding stand must be accelerated with it. Thus, in addition to the usual running tension which is set by the braking means, additional tension is put into the sheet to provide this acceleration. When decelerating, the converse is true and the sheet loses tension.

Because of this and to hold tension as roll diameters change, electric motor drives are being used for driving both the unwinding and winding reels and supercalenders, and the unwinding reels on winders. These drives are provided with amplidyne control for maintaining constant tension and for introducing inertia compensation to take care of acceleration and deceleration.

They have one other important advantage. As speeds and widths increase, the horsepowers which must be absorbed by mechanical friction brakes on unwinding stands become very substantial—frequently in the order of 200 or 300 hp. Special cooling means must be employed such as water cooling. Maintenance may become a problem. The electric motor drive, on the other hand, actually uses this horsepower by returning it to the line so that the energy does not have to be absorbed and wasted. This also yields a substantial saving in electricity required for operation. In the case of large machines this can easily amount to $3000 or $4000 a year, which is worth while.

Amplidyne control also is used for the main drive itself of the supercalender or winder. The use of the amplidyne in these control circuits permits considerable simplification and allows us to do the job better from the maintenance viewpoint. Since winders and supercalenders are frequently started and stopped, severe service was imposed on generator field rheostats in the past, and we have looked long and hard for a satisfactory solution. With our new equipment, the amplidyne in effect takes the place of the field rheostat and it is necessary only to have a small control rheostat to adjust the amplidyne. It is an easy matter to make this substantial and reliable.

As a result, we have once more gained in reliability, performance, and reduced maintenance.

Apparatus—General

In addition to the important main drives in paper mills, there are also the great number of motors driving machines for wood and stock preparation, and for finishing and converting operations. We have much new electrical equipment which will be of interest here. Some have been in use in the industry for a few years or more, others are just making an appearance.

Thymotrol: There is the *Thymotrol,* (Motortrol, etc.) which is an adjustable speed drive utilizing a d-c motor and an electronic unit which provides d-c power from the a-c line recently, in a self-contained box. The power supply consists of thyratron rectifiers for converting the a-c to d-c with a suitable transformer to obtain the correct voltage on the d-c motor. This drive has all of the advantages of a d-c motor with electronic control. Very wide speed ranges are possible, more than 20 to 1. Rapid acceleration and deceleration can be obtained. Speed regulation is excellent, with the standard unit providing better than 2%. For special cases, by the addition of a tachometer generator to the d-c motor, this error can be reduced to less than ½ of 1%. The same unit also provides a current limiting control so that the drive can operate in such a manner that its torque is held constant rather than its speed. By suitable arrangements, it is readily made to follow the speed of some other machine. Thymotrol drives are available up to 75 hp. but because of first cost compared to other arrangements, are most frequently used up to about 7½ hp.

Thus, this type of unit lends itself very well to operations where adjustable speed over fairly substantial ranges is required. It can be used on wood handling equipment such as conveyors, pulp washers and agitators, small winders and a multitude of finishing machines. Photoelectric control readily can be introduced into Thymotrol circuits, thus further broadening its usefulness.

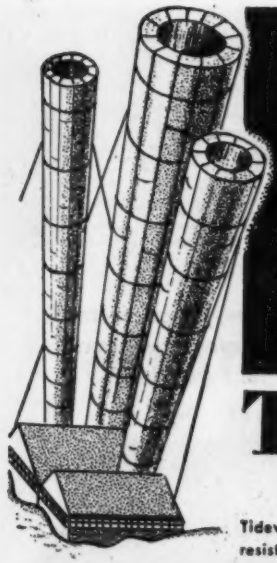
Speed Variator: When the advantages of electronic control, such as above-average speed regulation, torque limit, flexibility of control, etc., are not necessary, there is the speed variator set. This consists of a motor generator set, a-c starter and d-c control in a self-supporting, unit cabinet for easy installation. It can be used anywhere in the mill where precise control is not a factor. For tougher jobs it can be obtained with either amplidyne or electronic brains.

Electronic-Amplidyne Package: Then there is another equipment, just making its first appearance, which we might call *the electronic-amplidyne package*—it is a packaged brain unit. It consists of a small electronic preamplifier suitable for taking a variety of signals and an amplidyne generator. The generator may be used to operate a d-c motor directly or to excite the field of a larger generator, which in turn would operate a motor. The electronic panel will take almost any kind of signal, speed, current, position, photoelectric output, pressure, temperature, etc., and make the amplidyne do something about it. The combination is treated as a unit by us and will be stocked for rapid shipment. It is so flexible that we anticipate a large number of applications for it. For example, using such a handy packaged unit we might by some means judge the whiteness of bleached pulp and control a mixing valve that adjusts the amount of bleaching agent to be mixed with the unbleached pulp. On the other hand, the same unit might be used with speed control to control the speed of a rotary knife with respect to paper speed.

Dielectric Heating: Dielectric heating is finding a place in the paper industry. As you know, when an insulating material is put between the plates of a capacitor and very high frequency radio waves are passed through it, losses in the material heat it up, internally.

Using steam or hot air is of course a much cheaper source of heat, but the *internal* heating of dielectric means makes it superior in certain cases. For example, the warp fibres of some rugs are composed of twisted ribbons of kraft paper. After the paper has been twisted into rope form, it is treated chemically in a bath and rolled into cones like yarn. It is then dried and shipped.

(Turn to page 1108)



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A new grinder of massive proportions with extra heavy duty construction throughout for precision grinding chipper and paper knives. Especially suitable for grinding doctor blades. Fully automatic with two motor drive, one 10 HP to drive 16" segmental grinding wheel, separate 3 or 5 HP for carriage drive. Extra wide V-Ways and transmission bearings automatically lubricated for literally mile after mile of fast, low cost cuts. Smaller sizes down to 48". Ask for bulletin 311.

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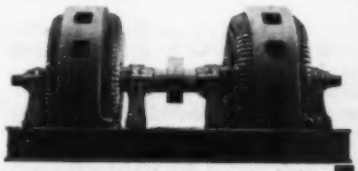

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75	Gen. Elec.	K—TEFC	220	1200
60	Gen. Elec.	K—TEFC	220/440	1200
60	Gen. Elec.	KG—TEFC	220/440	1200
60	Gen. Elec.	K—TEFC	220/440	1800
50	Gen. Elec.	K—TEFC	220/440	1800
50	Wstghse.	CS—TEFC	440	1200
40	Gen. Elec.	K—TEFC	220/440	1200
40	Wagner	CF—TEFC	220/440	1800
40	Gen. Elec.	KF—TEFC	220/440	1800
30	Gen. Elec.	KF—TEFC	220/440	1200
30	Gen. Elec.	K—TEFC	220/440	1800
25	Gen. Elec.	K—TEFC	220/440	1200
25	Wstghse.	FR—TEFC	220/440	1200
25	Gen. Elec.	K—TEFC	220/440	1800

SLIPRING MOTOR

600	Gen. Elec.	I—M	440	350

SYNCHRONOUS MOTORS

250	Allis Chlrs.		2200	720
2—200	Allis Chlrs.	PF	2300	360

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NEW EQUIPMENT AND SUPPLIES

Motor Driven Production Control Device

Spiral Mfg. Corp., 3612 N. Kilbourn Ave., Chicago 41, Ill., has recently introduced a new motor-driven business management machine that is said to permit more efficient, more accurate control over production, inventory, purchasing and other plant operations.

The new machine, known as *Chart-o-matic*, consists of a graph chart on rollers, driven by an electric motor. Finger-tip control permits the chart to be rotated in either direction, at variable speeds; chart can be stopped at any position. All operating data, such as stock on hand, material on order, incoming supplies, completed units, shipments, etc., is posted on the chart. Then, by simply rotating the chart, the entire activities of the plant are shown at a glance. According to the manufacturer, this device

gives supervisors an accurate, immediate visual record of work progress, units completed, shipments, absenteeism, etc.; it guides the purchasing department by giving a constant picture of stock on hand, stock on order, parts required, material received; it helps avoid inventory surpluses, averts production delays due to parts shortages.

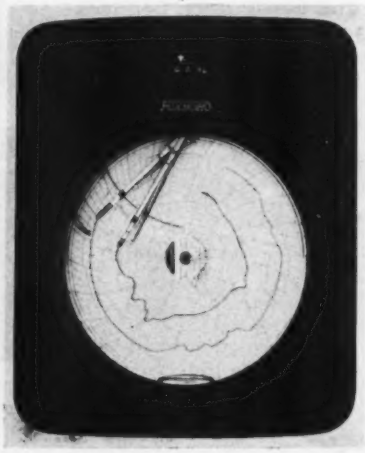
The manufacturer further states that *Chart-o-matic* is flexible in application, easily adapted to many operations. Each machine has a capacity of up to 2000 separate items which can be posted in quantities from one to millions.

The entire unit is contained in sturdy metal cabinet, finished in black crackle enamel with chrome trim. Overall size: 36½ in. long, 13¾ in. deep, 11 in. high. Weight, 84 lb. Operates on 110 volts, a-c.

Auto-Selector Controller

An important addition to the line of industrial control instruments is offered by The Foxboro Company, Foxboro, Mass. This new instrument controls, selectively, from either of two related variables, by positioning a single valve, damper, or other operator. This selection is determined by the variable having the greater tendency to exceed its pre-set limit; and the transfer of control is made smoothly, instantly, and automatically.

The Auto-Selector, it is claimed, not only does the work which previously required two controllers, but has an added important advantage in that it may incorporate the automatic reset function in the control of either or both variables. The design of the instrument embodies two measuring systems and two inter-connected Foxboro Model 40 control mechanisms. Control action of both mechanisms may be on-off,



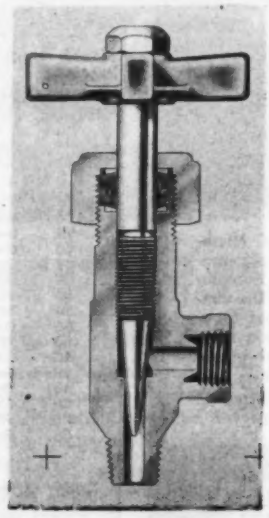
proportional, proportional with derivative, proportional with reset (Stabilog), proportional with reset and derivative (Hyper-Reset) or any combination of these.

The Auto-Selector Controller is available as a recorder or indicator.

Micrometer Needle Valve

A specially designed needle valve for the sensitive metering of fluids and gases has been developed by The Parker Appliance Co., Cleveland, Ohio.

The micrometer needle valve is a modi-



fication of the company's compact, forged-body industrial valve design, but has 5/16"-40 stem threading for close adjustment, and a long 10° included angle tapered needle for fine metering.

The standard valve is of high-strength brass, but aluminum alloy bodies can also be supplied. Needle stems are machined to close tolerances in duronze. A premolded packing insures a long-life stem seal.

The valve is available in ⅛" and ¼" sizes, with eight port combinations of male and female, pipe and tube connections permitting a variety of installation possibilities to meet virtually any requirement.

Welding Rod for Copper

A new development in the field of torch welding rods is announced by Eutectic Welding Alloys Corporation, 40 Worth Street, New York 13, New York. This welding rod, *Eutecrod* 1805FC, is designed for joining copper and its properties of "Thin-Flowing," High Strength, and Excellent Affinity for copper, insure uniform deposits.

Eutecrod 1805FC is recommended for a broad number of production applications called for in the joining of copper. It may be used with a torch adjusted for slight oxidizing flame, atomic hydrogen or twin carbon arc, where no oxyacetylene equipment is available.

Flux-coated with the improved coating for greater capillary action and greater speed

of application, Eutecrod 1805FC may also be used with its companion flux, Eutector Flux 1805. This will reduce welding heat and avoid distortion and stress common to ordinary welding operations. It is a Thin-Flowing, low melting "brazing type" alloy with an unusually high tensile strength of 90,000 psi and a Brinell hardness of 160-180; it is available in sizes ¼", 3/16", 3/32" and ⅛" flux coated and in size 1/16" bare. It is designed particularly for oil refinery equipment, piping and fittings, roofing repair, copper tanks and tubing, copper valves and vats, copper kettles, heating apparatus, etc.

Electronic Air Filter

An electronic air filter, the *Electro-PL*, has been developed by American Air Filter Co., Inc., Louisville, Ky., with an intermediate cleaning efficiency for applications where the efficiency of a mechanical filter is too low and that of an electronic precipitator is unnecessarily high. The new filter is basically an electronic precipitator without an ionizing unit and contains a collector element of electrostatically charged Airmat paper.

This paper is a laminated cellulose product composed of a number of plies of porous, tissue-like sheets formed of short fibers in

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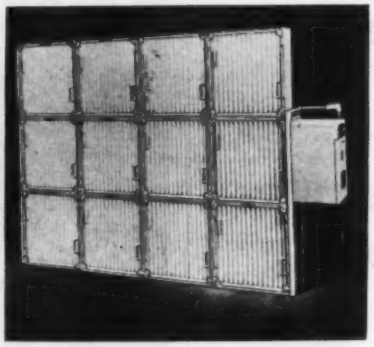
"jack-straw" arrangement and is also used as a filtering media in mechanical filters. When an electrostatic charge is applied to the paper, the plies tend to separate and each individual fiber becomes a collecting electrode which attracts and holds dust and smoke particles. This action practically doubles the cleaning efficiency of Airmat paper.

Since the *Electro-PL* will continue to function as an efficient air filter when de-



energized, its operation may be varied to suit the dust condition—as an electronic air cleaner during the winter months when a smoky atmosphere is prevalent and as a dry-type air filter during the summer months.

The elimination of the ionizer not only reduces the first cost of the filter below that of an electronic precipitator but also results in lowered power consumption. Maintenance is also simplified since the low-cost Airmat paper is replaced with new material when it accumulates its full dust load.

Infrared Heat From Tempered Glass Plates

Tempered glass plates which deliver infrared heating for all uses requiring even, controlled heat—with the strength, corrosion-resistance and durabiliity of glass, are now available from Oscar Fisher Company, Inc., 104 Worth St., New York City.

These plates feature a metallic compound applied to the rear surface of the glass in a continuous strip. This metallizing will last the lifetime of the glass. Thermostatic controls maintain heating level.

Stock sizes available are 15" x 20"—16" x 24"—19" x 24" and 16" x 48". Stock plates are available in pebbled glass surface.

On special order any standard glass finish or plate size can be obtained. A wide range of wattage and voltage specifications are readily available.

For certain applications, these plates have material advantage over infrared lamps: (1) breakage loss greatly less, (2) area to be heated is fully covered, (3) increased efficiency as regards current consumption.

Dial Scale Mechanism

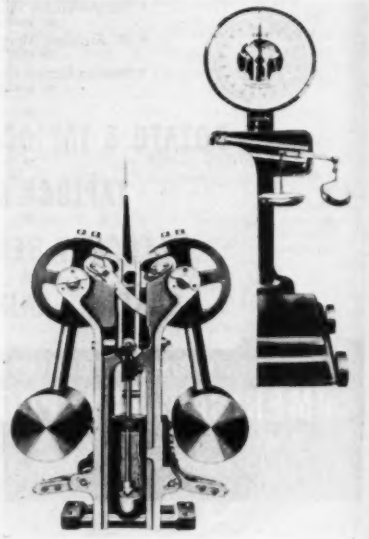
The *Magnetrol*, a basically new dial scale mechanism just introduced by The Yale & Towne Mfg. Company, Philadelphia Division, achieves:

(1) a straight line relationship between the platform load and pointer movement without specially filed cams, adaptations to prevent backlash or delicate adjustments of the angular relationship between sectors,

(2) a reduction of service adjustments from the usual six or seven to only two, and

(3) full but light engagement between the pointer rack and pinion by means of a permanent magnet.

Also noteworthy is the fact that all moving parts are mounted at three fixed centers in a single gray iron casting. Further, they



move on precision ball bearing surfaces to minimize internal friction.

The capacity of the mechanism under direct loading without any lever system is 25 lb.; its application to large industrial loads, up to 50 tons is a matter of lever linkage. Its guaranteed accuracy is one part in 1000, but accuracies of one part in 2000 are readily obtained. The dial head, which contains a 20-inch diameter reading-line dial chart, can be swiveled through 360 degrees.

Mono-Block Embosser

Development of a new type embosser, known as the Mono-block, has just been announced by George J. Prager of Unicrafts Inc., designer, and W. H. Ware, President of Hobbs Manufacturing Co., manufacturer of the machine. The new embosser, now in full production, is designed for use in the paper, foil, plastics, graphic arts, and leather fields, and offers the manufacturer top performance combined with many new and outstanding features.

Two models of the machine are available —straight screw pressure control and a hydraulic control model—both of which feature mono-block construction, quicker roll changes, silent drive, and accessibility. Both models are available in 32, 42, and 52 inches.

The machine frame is of mono-block construction resulting in a single, rigid, steel unit, many times sturdier than the conventional cast iron frame. This new construction eliminates interfering tie rods and allows low, compact, accessible design. The

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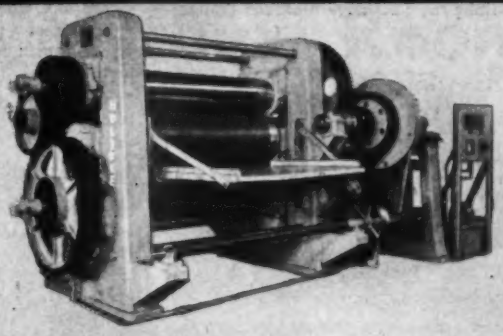

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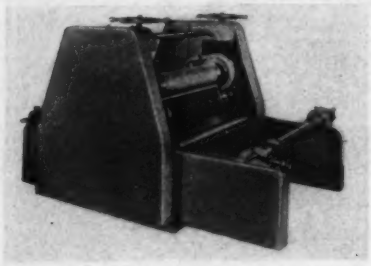
bearings, housing for the embossing roll, carries the bearings, lubrication, oil seals, and space sleeves in a self contained unit, permitting the quickest possible roll change.



The entire housing may be transferred from one roll to another without loss of lubrication. Bearings are heavy duty, self aligning roller bearings.

▼

New Developments . . .

(Continued from page 1102)

Ordinary drying methods could not produce uniform moisture content and this resulted in unevenness in the final rug. The problem was solved by using two 60 kw dielectric heaters on conveyor lines over which the cones are passed. Because the heat was generated from the inside out, uniform drying was obtained and the quality and quantity of acceptable product greatly increased.

In the future, other uses will be found in the paper industry for this important technique, although its use will be limited to special jobs where heat must be gotten into something of a pretty good size and the expense justified by the evenness and speed of heating.

AC Motors and Control: Advances are being made in what we regard as ordinary *a-c motors and control.*

Many electrical manufacturers have redesigned their standard squirrel cage induction motors for better mechanical protection and better insulation. Thus, the standard open motor has become really a dripproof machine in that it is protected against falling water. The insulating materials used are considerably better than they have ever been so that this combination can frequently be employed where formerly a splashproof machine would have been required.

Totally enclosed, fan cooled machines will come into use more and more, although their application must be carefully considered in paper mills. Lint, pulp or broke, if any is present in large quantities, can plug the ventilating openings. In view of this, under some circumstances it may be necessary to go to machines which are totally enclosed but without ventilating openings. In the smaller sizes, this can be accomplished by simply buttoning up the entire motor; but in larger ratings it is necessary to get rid of the heat by means of a heat exchanger. In many cases, this can be done most readily by means of an air-to-water heat exchanger.

There is no question but what all of us—paper mill, machinery builder, and electrical manufacturer—are going to give more attention to motor enclosures. At the present time, an AIEE Committee on the paper industry is studying the problem and will assemble reports from paper mills themselves. Motors have done well under terrible conditions, but require periodic maintenance and inspection, which is expensive. In many cases it will be cheaper to put in a motor which is properly protected and forget about it. Furthermore, outages are having more and more financial consequence, so that the possibilities of shutdowns must be minimized.

There is a new trend in *general purpose control* which got its start during the war. Nowadays, general purpose control for groups of motors is concentrated in convenient places through the use of factory-assembled control centers. Buses for supplying all of the motors are built-in and adequate interrupting capacity for short circuits is provided by suitable breakers or fuses. For low voltage work, 600 volts and below, such construction is referred to as Cabinetrol, Unitrol, etc.

In high voltage control, the same general philosophy is used, with a line-up of high voltage starters provided with a through bus overhead. A considerable achievement has been made here in that adequate interrupting capacity is obtained now by the use of high voltage fuses. In the past circuit breakers could have been used, but in many cases have not been, simply because they were so expensive. The problem of interrupting a short circuit was just ignored and it was hoped that the main circuit breakers in our power stations would do the job. This was a dangerous practice and could result in fires, damage to machinery, and even to personnel. With the advent of the high voltage fuse, however, this situation is radically changed. It is possible, now, to provide adequate short circuit interrupting capacity at a cost that is well within reach. Furthermore, the fuses operate so quickly that they limit the damage, so that if a winding in a motor fails, the short circuit frequently is interrupted before other conductors or the iron punchings are burned. The development of this fuse has been a boon to paper mills.

Power Distribution Equipment: In modern *power distribution practices*, control centers such as we have seen are spotted throughout the mill and supplied by high voltage feeders. When required, the high voltage is stepped down through transformers at these centers. The transformer and control center are integrated and treated as a unit. In other cases, when feeder circuit breakers are required at these load centers, switchgear panels—either high or low voltage—may be combined with the transformer.

Such factory built *load center units* offer many advantages to the user. First of all, the responsibility for making the transformer go together with either switchgear or control is centralized with one manufacturer. Secondly, the user has no problem of making coordinating drawings, which he would have, if he bought separate pieces of equipment. Third, the factory construction is superior to what it would be in many cases, if the user had to do the job himself. This construction results in better reliability and less maintenance.

In transformers themselves, one of the latest advances has been the development of the air-cooled, dry-type transformer, with the elimination of liquid immersion. This offers a considerable benefit because there is no liquid. Thus, draining is not required for maintenance work; there is no need for periodic liquid filtering or changes; and the transformer is lighter in weight. However, such transformers must be applied with caution in paper mills. If a clean, well ventilated electrical room is available, there is no question about their installation. However, if lint conditions are severe, there are possibilities that ventilating passages can become sufficiently clogged so that ventilation will be seriously impaired. Furthermore, since the transformer windings no longer have the protection of a dielectric liquid, moisture and chemical gases which are always present in paper mills may attack the windings.

Turbine Generators: Consistent advances have been made in the efficiency of the *large turbine sets* in our generating plants. The goal is, of course, to ever higher temperatures and pressures for greater thermal efficiencies. The principal limitations at the present time for the turbines themselves are in the metals used, which must withstand these high temperatures and pressures. For the past 15 years, we have had a research investigation under way with samples under continual test throughout that time, seeking to find the best alloys for the job. The improvements will not be drastic, but you can be sure that the upper limits will constantly be pushed higher, and substantial fuel economies will result.

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From Boiler Room to Machine Room

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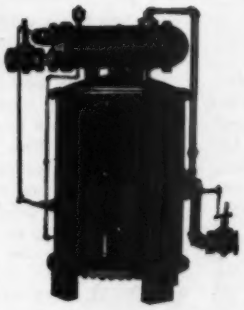
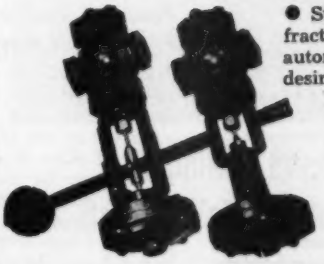


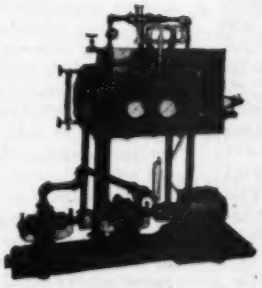
● Stickle Equipment permits economy in the production and use of steam. Stickle Open Coil Heaters and Purifiers heat more water in less space—delivering feed water to pump at temperature of saturated steam in heater, removing scale-forming substances, eliminating non-condensable gases, and making one-sixth of boiler supply distilled water.

STICKLE EQUIPMENT PROVIDES EFFECTIVE CONTROL



● Stickle Valves, sensitive to fractional variations in pressure, automatically maintain dryers at desired temperatures and make possible maximum production volume with product at a predetermined moisture content. No waste of steam. Uninterrupted production. Stickle Control is simple, positive efficient.

STICKLE EQUIPMENT SUPPLIES PROPER DRAINAGE



● Stickle Equipment effectively eliminates condensate and air from dryers. Whether it is Stickle Differential Drainage or Stickle Individual Trap Systems, drainage is positive, rapid, complete—with sight check on operation of each dryer. Stickle Differential Boiler Return System returns condensate directly to boilers under pressure at maximum temperature.

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TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in the American and foreign press.

Possible Utilization of Linseed Straw

The production of linseed oil in the British Empire is being increased and it is probable that fairly large amounts of linseed (flax) straw will become available. So far this material in England is a waste product, and although it contains fiber it is still unused. The baled straw contains about 30% of leaves, dirt and chaff, and the yield of this straw varies greatly depending upon the district in which it is grown and on the season. A good average yield (in the U.S.A.) is about ¾ ton per acre.

The uses suggested are papermaking, rayon production and as a raw material for thread, twine, rope, etc. The chief uses (in the U.S.A.) are for cigarette paper, together with carbon paper, air-mail and thin book papers. The main problem remains the economical production and the handling of the straw. Unless special machinery is used to separate the best fiber from the shives, it is impossible to obtain a pape rcomparable to that produced from linen rags. The straw (as a whole) may be cooked by the kraft process to furnish a medium grade wrapping paper, and for conversion into boards.

As long as other raw materials are still available at reasonable cost, papermakers (in England) will probably not be interested, but this situation (in Great Britain) may change. The present day unavailability of suitable digesters in England would prove a handicap. In India, investigations with the straw as a raw material for rayon manufacture have not been too promising. The suitability of the straw for twines, etc., and its production (as related to yield of seed) are discussed. Fifteen references. Anon. *Bull. Imp. Inst.* 45, No. 3, 245-52 (1947); Paper-Maker 116, No. 2, 85, 87 (1948); *World's Paper Trade Rev.* 130, No. 5 (July 29, 1948).

Coarse Impurities and Fiber Fractionation

Using a single apparatus, the authors have determined the coarse impurities of mechanical pulp, which they term the "Splittergehalt." These would include wood, bast and bark particles which are so large and so relatively inelastic that they later interfere with sheet formation. The new laboratory screen, although it looks somewhat like the one used by the Norwegian Research Institute for the Paper Industry, is actually built on a different principle, and is capable of determining the coarse particles and of fractioning the fibrous parts of the pulp. Details of the apparatus (with scale drawing) are given and its operation is described. The mean relative error in determining the coarse particles is about 5%, with an absolute error of only 0.17%. In a series of experiments, with very fine, normal and coarse groundwood and with the tailings to be sent to the refiner, the authors classify the different stocks in terms of the percentage of coarse particles.

Their study was also extended to commercial tailings, some of which contained over 50% coarse particles. The use of the apparatus for fiber fractionation of mechanical and chemical pulps and of regenerated paper stock is also described. The authors discuss briefly the fiber fractions present in a pulp in relation to the beating schedule. The new apparatus is built by Wolff and Sons, Duren, Rhineland, Germany. About 18 references are given. W. Brecht and M. Holl. *Das Papier* 2, No. 5, 85-92 and No. 7, 138-42 (1948) (In German).

Practical Evaluation of the Brecht-Holl Apparatus

See the preceding abstract. The present authors have shown that the fractionating apparatus described by Brecht and Holl serves just as well as do the Research Flour Tester of Klem-Hurum and the Swedish H. S. Tester for the fractionation of mechanical pulp. Comparative studies with the three types of equipment include the effect of length of the period of washing, water pressure during grinding, etc. Graphs and tabulated data are given.

The same authors have also discussed the present status of screen analysis in controlling the production of pulp in groundwood mills. Their tabulated summaries show the relationship between screen analyses, pulp strength and the operating conditions in the mill. The fluctuating results of a four-day mill run are followed graphically, especially with regard to pulp quality. Difficulties in applying analytical data to current mill control are emphasized.

The authors also make special reference to the Brecht-Heiniger wet-strength tester which they feel may serve to bridge a gap in the testing of mechanical pulp. Fundamental studies of pulp quality are still essential, however. Besides their graphs and mill data, the authors give 20 references to the literature, and 10 photomicrographs. Robert Steinlin and Karl H. Klemm. *Das Papier* 2, No 5/6 92-4 and 7/8, 130-8 (1948) (In German).

Further Applications of Noll's Netzometer

In a previous communication the author described in detail the use of a simple instrument for testing the wettability of various paper samples (Cf THE PAPER INDUSTRY AND PAPER WORLD 30, No. 4,648 (1948)). The use of this instrument has now been extended to a comparative study of the rates at which various wetting agents, detergents, and textile dressing materials wet a specific paper sample. The reagent, in concentrations of 10 g. per liter, at 20 deg C. is allowed to act upon the test sample (as previously described) and the rate of wetting is determined as previously outlined. Results are given for solutions of 20 commercial agents. Marked changes in wetting were noted in the case of certain substances (like "Nekal A") when the reagent was extracted with alcohol prior to the test. In this case Nekal A showed a marked decrease in the rate of wetting—the time going from 63 seconds up to 574 seconds. On the other hand "Igepon A" (paste) which initially was a very poor wetting agent was greatly ameliorated by alcoholic extraction, the speed of wetting decreasing from over 1 hour to about 30 seconds. Triplicate determinations were always made and the results were tabulated. 25 references are given. August Noll. *Wochbl. Papierfabr.* 76,163-5 (1949) (In German).

Behavior of Bitumens and Pitches on Heating

Even when heated for relatively short time periods, at 110 C. with stirring in the presence of air, bitumen (I) and coal tar pitch (II) suffer a certain amount of degradation. Laboratory tests showed that at 140-80 deg., I and II suffer seriously and that such properties as elasticity, adhesive power, and resistance to cold temperatures are all adversely affected. Thus they become far less suited for use in the paper industry. Long heating at higher temperatures raised the softening points of both I and II, and increased the so-called "brittle temperatures." The latter seem to be more seriously affected in the case of II than in I.

The author includes laboratory data and emphasizes the importance of avoiding local overheating whenever I or II are melted. He gives a diagrammatic sketch of a suitable kettle heated by an electrically controlled oil bath and provided with adequate stirring equipment (which is manufactured by Feld and Hahn, Bendorf, Germany). The industrial importance of these findings are stressed. Agust Noll. *Wochbl. Papierfabr.* 76, 108-110 (1948) (in German).

Spontaneous Combustion of Porous Fiberboards

The spontaneous overheating of porous fiberboards while in storage appears to be a serious hazard. Acording to Kollman (*Technologie des* Holzes) there is a heat of swelling when dry wood cells absorb moisture, but the present author does not agree that the heat developed is due only to the swelling phenomenon. He arrives at this conclusion as the result of his own measurements. The drying procedure seems to be followed by an exothermic reaction, which requires further study.

It is suggested that the boards after drying and previous to storage in piles be cooled to at least 60 deg. C. on their surface. This may be accomplished by spreading them out and allowing free access of air. This procedure means additional handling and greatly increased storage space, hence a special cooling arrangement installed after the dryers would be desirable. Björn Holmgren. *Svensk Papperstidn.* 51, No. 10 230-2 (1948) (Original in Swedish, with German and English summaries) through *Bull. Inst. Paper Chem.* 19, 16 (1948).

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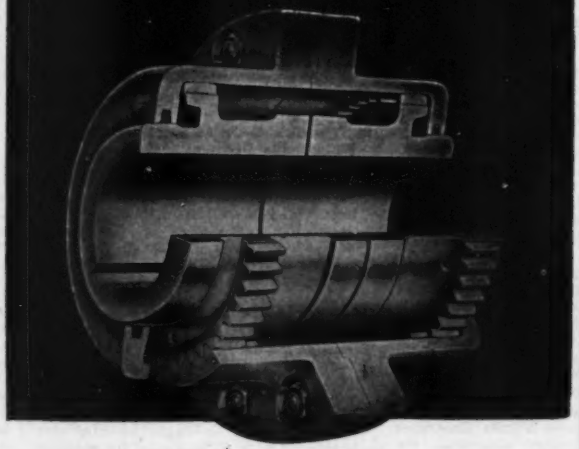

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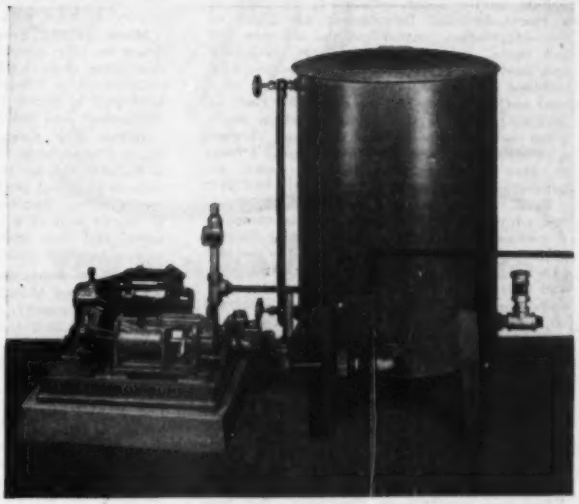

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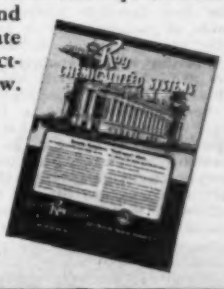

Write for Bulletin 451 also Technical Paper 51 "What the Power Engineer Needs to Know About Chemical Feed Systems for Water Treatment."

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New Catalogues and Publications

Alloy Manufacturing Company, Inc., Horning and Curry Roads, Pittsburgh 27, Pa.—Just issued is a six-page, two-color bulletin, which illustrates examples of fabrications in stainless steels, monel, nickel and various clads. Included in the illustrations is a screw conveyor for the chemical industry.

Allis-Chalmers Mfg. Company, Milwaukee 1, Wis.—The operation of this company's sodium zeolite water softener is described in a recent bulletin. Descriptions are given of the construction features of the softener and salt tanks, control valves, meters, backwash and rise controls, piping and accessories. Also included is a diagrammatic arrangement of a dual sodium zeolite softening system. Lists of equations indicate the reactions which occur when normal raw water salts pass through a completely regenerated sodium zeolite softener, also equations giving sodium zeolite regeneration reactions. Ask for Bulletin 28B7107.

E. C. Atkins and Company, Indianapolis 9, Ind.—Now being circulated by this company is a 60-page book, "Tools for the Filing Room." Practical suggestions are given for the use and care of large and small circular, and wide and narrow band saws. The latest filing room tools are catalogued. There are four illustrated pages on welding band saws. This is a valuable book for saw filers and users of mill and industrial saws and tools.

Associated Valve & Engineering Co., 1150 West Marquette Road, Chicago 21, Ill.—Just received from the printer is a bulletin on stainless steel safety and relief valves made by this company, for the chemical industry.

Elliott Company, Electric Power Dept., Ridgway, Pa.—Just released by this company is Bulletin PB 2000, describing its low speed Fabri-steel synchronous generator. The construction features are fully explained and illustrated with 15 detailed views. Special mechanical modifications with illustrations are also included.

Eutectic Welding Alloys Corporation, 40 Worth St., New York 13, N. Y.—A new eight-page bulletin announces the latest improvements in low heat welding alloys made by this company. It stresses the technically improved alloys available for all torch and arc users: Eutectrode 24, for cast iron welding without preheat; Eutecrod 185FC, with new improved flux-coating, and Eutecrod 1805FC, for joining copper. It also contains an announcement of Cuttrode for cutting thin sheet metal. Graphs are used to explain the advantages of these products for low heat welding. Actual case histories and illustrations are included, together with complete reference charts for all metals.

International Nickel Company, Inc., 67 Wall St., New York 5, N. Y.—A revised list of current publications on nickel alloy steels, nickel cast irons, nickel brass and bronzes, and nickel plating, is now available from this company. The publications cover the production, fabrication, properties and uses of nickel alloys for industrial applications, and the production, properties and uses of nickel electro-deposits. Another helpful booklet is its "Standard Specialties" Catalogue, which lists about 200 standard products for corrosive and high temperature service. This is the first complete compilation of products made of monel, nickel or inconel. Copies of this catalogue are available to industrial purchasing agents, engineers, product designers and other executives concerned with purchase and product specification.

Lewis-Shepard Products, Inc., 320 Walnut St., Watertown, Mass.—Available from this company is Catalogue No. 23, listing materials handling equipment. Described and illustrated are various types of power fork, power jack-lift, hand operated lift and floor trucks; skid platforms and storage racks, as well as stackers and cranes. Several illustrations are given of ways in which this materials handling equipment can be used by paper manufacturers.

Metallizing Engineering Company, Inc., 38-14 30th St., Long Island City 1, N. Y.—This company has issued a new catalogue of its complete line of metallizing equipment and supplies, entitled, "The Best of Everything for Metallizing." Each piece of equipment is clearly illustrated and described, also metallizing wire. Ask for Catalogue No. 401.

Michigan Pipe Company, Bay City, Mich.—A six-page broadside just issued by this company, specifically treats the subject of modern industrial piping for: water, corrosive liquids, chemical gases, and paper and pulp stock. One section of the broadside is devoted to pipe designed particularly for handling paper mill stock and solutions used in stock preparation. Recommendations of wood-lined pipe are given. This piece of literature is well illustrated and printed in color with metallic ink.

Micro Switch, Freeport, Ill.—Recently published by this company is data sheet No. 46, describing their V4-12 and V4-14 low torque switches. It is illustrated with diagrams. Also published is Micro Tips, for plant engineers, electricians and maintenance men.

Milton Roy Company, 1300 E. Mermaid Road, Philadelphia 18, Pa.—Just off the press is Bulletin 488, on the "Airometric" controlled volume chemical pump with rotary air or gas motor drive. Applications for the pump are given, as well as a capacity-pressure selection table, and flow sheets indicating installation and automatic control diagrams.

Northern Equipment Company, Erie, Pa.—An illustrated bulletin, No. 479, is obtainable from this company, describing its boiler water level control in use at the St. Regis Paper Co., Deferiet Mill. Also available is Bulletin No. 481, showing boiler feed control at Calco Chemical Division of the American Cyanamid Company. Both bulletins are illustrated with photos and charts.

Geo. P. Reintjes Company, 2515-19 Jefferson St., Kansas City, Mo.—In a bulletin just published by this company, "Floating Walls," is presented the solution of problems encountered in designing airtight refractory enclosures for modern water walled boilers. Ask for Bulletin 478.

Joseph T. Ryerson & Son, Inc., P. O. Box 8000-A, Chicago 80, Ill.—A new 32-page bulletin on steel tubing, published by this company, contains information on seamless and welded carbon steel tubing, stainless tubing and pipe, structural tubing and seamless and welded boiler tubes. Many applications are given for mechanical tubing; also information on machining, heat treatment and fabrication; methods of specifying size and quantity. There is a discussion of the use of tubing instead of bars for machined parts. Reference data, such as tubing tolerances, mechanical properties, tempers, decimal equivalents, analyses, definitions, etc., are also included. Write to the above company, or its district offices.

Schutte and Koerting Company, 12th and Thompson Sts., Philadelphia 22, Pa.—A new bulletin issued by this company describes SK heat exchangers and vapor condensers. Comprehensive data on single and two pass heat exchangers, vapor condensers, U-tube and tank type exchangers, radiafin tube exchangers and vent condensers is given in this booklet, together with photographs and sectional drawings. Colored cross-section drawings show methods of operation, while dimension drawings and tables give over-all sizes of various types. Requests for this bulletin, No. 12-H, should be addressed to the Advertising Department of this company.

Service Machine Company, 158 Miller St., Elizabeth, N. J.—A leaflet just introduced illustrates this company's machine tool facilities, by means of photomontages. The company is now expanding its service in the developing and building of efficiency machines to the paper manufacturing field. Write to Department L, Service Machine Company, Elizabeth, N. J.

Shartle Brothers Machine Co., Middletown, Ohio—Just off the press is a fully illustrated eight-page folder, in colors, describing the high-density centrifugal pump manufactured by this company. It contains sectional views of the pump, also a wide assortment of propeller designs, tables and efficiency curves. Also available from this company is the Miami Jordan folder, containing several bulletins describing its different types of Jordans. In addition to complete descriptions, photos, layout templates, specification and parts lists are included.

Shipping Container Institute, 475 Fifth Ave., New York 17, N. Y.—Copies of a helpful 12-page, two-color booklet, "OK on Delivery," may be had from the institute without charge. It presents the principal damage causes that shippers are in the best position to correct, and offers helpful suggestions for overcoming them.

Taylor Forge & Pipe Works, P. O. Box 485, Chicago 90, Ill.—A four-page illustrated bulletin, which includes drawings, dimensions and prices of new type fittings and flanges for stainless piping systems, available in Stainless 304, 347, 316 and other materials, has been published by this company. Ask for Bulletin No. 483, entitled, "A New Approach to Flanged Piping."

Timber Engineering Company, 1319-18th St., N. W., Washington, D. C.—A brochure entitled "For Users of Wood and Forest Products," is available to architects, engineers and others who have come into industry since the war. It outlines technical services available, covering not only timber engineering and designing, but also timber and forest products research, product development and chemistry. Also available from this company is a bulletin on "Colpres 10," a quick-setting, room temperature urea resin adhesive for the woodworking industry. Ask for Bulletin Teco 7-27-48-23.

Towmotor Corporation, 1226 E. 152nd St., Cleveland 10, Ohio.—Just released is a new and revised edition of the Fork Lift Truck Operator's Guide. It provides clear, concise instructions for the safe, efficient operation of a fork lift truck. Sections are also included on accessories and their operation, and suggestions for handling materials and containers of all types. One complete section is devoted to load-handling techniques. Sent free on request.

U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Los Angeles 54, Calif.—An attractive colorful bulletin presenting their new models of Varidrive motors has been issued by this company. The motor is shown in natural colors in different capacities. Interesting graphs and illustrations show new ways in which variable speed can be used. A diaphanous view of the motor illustrates the operating principles, with supplementary drawings in full color for major improvements in design.

Warren Steam Pump Company, Inc., Warren, Mass.—Recently issued by this company is Bulletin No. 245, which illustrates and describes their line of liquor pumps for process industries. These centrifugal pumps have a wide range of applications, including pumping of hot or cold erosive or corrosive liquids. Sectional views are used to illustrate mechanical features. Technical details are well covered in the text.

Worthington Pump and Machinery Corporation, Harrison, N. J.—Of special interest to paper manufacturers is Bulletin 1961, describing the multistage steam turbines, type "S" with oil relay governor, made by this company. Several illustrations show the application of this turbine to driving paper machines. Also available is Bulletin W-305-B1, on centrifugal pumps for belt, multi-V drive and motor drive.

The Yale & Towne Manufacturing Company, Philadelphia Division, 4530 Tacony St., Philadelphia 24, Pa.—Just published by this company is a series of six new three-color technical bulletins, with a total of 68 pages of data, diagrams, selection advice and practical application information on dial scales. The bulletins are well illustrated. The entire set may be secured in the form of a bound manual, or requests made for single bulletins, as follows: No. P-714-D, platform scales; P-714-F, bench scales; P-714-C, dormant platform scales; P-714-K, crane scales; P-916, weigh-can for the dairy industry, and P-714-G, counting scales. The last named has an entire chapter on "How to Select the Right Scale," complete with tabular information and a discussion of proper ratio specifications. Requests for the manual or single bulletins should be addressed to R. F. Miller, at the above address.

Books

The Functional Design, Job Applications and Job Analysis of Power Cranes and Shovels. This is the title of Technical Bulletin No. 1, issued by the Power Crane and Shovel Association, 74 Trinity Place, New York 6, N. Y. Illustrations of cranes and shovels are taken from the slide film, entitled, "The Changing World." The price of the book is 50 cents. It may be obtained from the association.

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Corduroy, Ladies'	6.25	to 6.50
Washables, No. 1	5.00	to 5.25
Percales	7.25	to 7.50
Light Prints, No. 1	7.25	to 7.50
Khaki Cuttings—		
Bleachable	7.00	to 7.25
Unbleachable	6.25	to 6.50
New White Canvas	11.50	to 12.00
New Mixed Blacks	5.50	to 6.00
Canton Flannels, Bleached	11.00	to 11.50
Shirt Cuttings—		
New White No. 1	11.00	to 11.50
White Shrunk	10.00	to 10.50
Silesias No. 1	8.50	to 9.00
New Unbleached	11.25	to 11.75
Fancy	6.25	to 6.50
Linen Cuttings—		
American	8.00	to 8.50
White	14.50	to 15.50
Grey	13.50	to 14.50

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OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.	
Roofing—		
No. 1	1.35	to 1.40
No. 2	1.25	to 1.30
No. 3 and No. 4	1.05	to 1.15
Twos and Blues—		
Repacked	3.25	to 3.50
Thirds and Blues—		
Repacked	3.00	to 3.25
Miscellaneous	2.25	to 2.50
Whites, No. 1—		
Repacked	4.75	to 5.00
Miscellaneous	4.00	to 4.25
White, No. 2—		
Repacked	3.75	to 4.00
Miscellaneous	2.75	to 3.00

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.	
New Dark Cuttings	Nominal	
New Mixed Cuttings		
New Light Silesias		
Light Flannelettes		
Unbleached Cuttings		
New White Cuttings		
New Light Oxfords		
New Light Prints		

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ex dock New York City

OLD RAGS

	per cwt.	
No. 1 White Linens	Nominal	
No. 2 White Linens		
No. 3 White Linens		
No. 4 White Linens		
No. 1 White Cottons		
No. 2 White Cottons		
No. 3 White Cottons		
No. 4 White Cottons		
Extra Light Prints		
Ord. Light Prints		
Med. Light Prints		
Dutch Blue Cottons		
French Blue Cottons		
French Blue Linens		
Checks and Blues		
Linsey Garments		
Dark Cottons		
Old Shopperies		

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	per cwt.	
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Domestic	8.00	to 8.50
Wool Tares—		
Light	8.00	to 8.25
Heavy	8.50	to 8.75
No. 1 Scrap Bagging	7.25	to 7.75
Manila Rope—		
No. 1 large	6.00	to 6.25
No. 1 small	5.00	to 5.25
Sisal Rope—		
No. 1 large	5.50	to 5.75
No. 1 small	5.00	to 5.25
New Burlap Cuttings	8.00	to 8.50
Jute Threads—		
Foreign (Nom.)	6.50	to 7.00
Domestic	6.00	to 6.50
Strings—		
No. 1 sisal	5.00	to 5.25
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Soft White, One-cut	110.00—	
Soft White, Misc.	80.00—	
Fly Leaf, No. 1	50.00—	
Fly Leaf, Woody, No. 1	40.00—	
No. 2 Mixed Col. Woody	30.00—	
Flat Stock—		
No. 1 Heavy Books and Magazines	21.00	to 22.00
Mixed Books	16.00	to 17.00
Ledger Stock—		
No. 1 white	60.00—	
No. 1 Mixed (Colored)	45.00—	
Manilas—		
New Env. Cuttings	90.00	to 100.00
New Env. Cuts, One-Cut	—	
Extra Manilas	—	
Manila Tab Cards, Free of Ground Wood	85.00	to 90.00
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Bleaching Powder—		
Drums, cwt.	3.25	to 4.25
Casein (Domestic Standard)		
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80-100 mesh (bags), lb.	30.00	to 31.00
Argentine, lb.	26.50	to 27.50
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Gelatine (silicin), lb.	1.25	to 1.35
Glye. (C.P.) drums, lb.	39½	to .40
Litharge, powd., bbl., lb.	19¼	to .20¼
Rosin (Gum)—		
New York, per 100 lbs.		
E	8.25—	
F	8.35—	
G	8.40—	
WW	8.85—	
Rosin (Wood), carlots	7.45—	
Salt Cake—		
Dom. bulk (wks) ton	24.00	to 28.00
Imp. bulks ex dock— (Atl. ports) ton (Nom.)	25.00	to ——
Soda Ash—		
Bulk (works), cwt.	1.10	to 1.20
Paper Bags, cwt.	1.30	to 1.40
Barrels, cwt.	1.50	to 1.60
Soda (Caustic)—		
Solid drums, cwt.	2.85	to 3.05
Ground and flake, drums, cwt.	3.25	to 3.50
Sodium Silicate—		
60 deg., 55 gal. drums, works cwt.	1.85	to 2.05
40 deg., 35 gal. drums, (works), cwt.	.80	to 1.45
Starch—		
Pearl, 140 lb. bags, cwt.	6.66—	
Pearl, barrels, cwt	6.66—	
Paper, (Sp.) bags, cw	6.66—	
Powdered, barrels, cwt.	6.77—	
Sulphur (Crude)		
(Mine) bulk, long ton	16.00	to 18.00
Talc—		
Dom. 100 lb. bags (mine) ton	20.00	to 28.00
Canadian	35.00	to 45.00
Titanium Dioxide—		
Barium Pig, bbls., lb.	18	to .18½
Calcium Pig, bbls., lb.	18	to .18½
Zinc Sulphide, bbls., lb.	11.50	to 11.75

WOOD PULP

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Bleached sulphite, Swedish. 165.00—	
Bleached sulphite, Finnish. 165.00—	
Bleached sulphite, dom.	134.00 to 135.00
Easy bleaching sulphite	—
Unbleached sulphite, Swed.	140.00 to 145.00
Unbleached sulphite, Fin.	140.00—
Unbleached sulphite, dom.	125.00 to 130.00
Unbleached kraft, Swedish.	127.50—
Unbleached kraft, Finn.	127.50—
Unbleached kraft, northern.	120.00 to 125.00
Unbleached kraft, southern.	110.00 to 125.00
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Bleached soda, domestic	130.00 to 135.00
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Boards—	per ton	
Binders	94.00—	
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Chip, tube and can	95.00—	
Chip, full blanding	97.50—	
Chip, sgl. mla. lined	95.00—	
Coated, white patent .016	120.00—	
.020 and heavier	110.00—	
Kraft liner	79.00—	
Filled News	90.00—	
Container	90.00—	

Book Papers—f.o.b. mill with quantity weight, manufacturing and other differentials allowed:

(Per cwt. in ton lots)

Uncoated (Untrimmed)

Book, White (M. F.)—	
A Grade E. F.	14.25—
B Grade E. F.	13.30—
C Grade E. F.	—
D Grade E. F.	—
No. 2 Uncoated Offset 4 sides, White	—
Machine Coated White (Trimmed 4 sides)	
No. 1 Glossy	19.50—
No. 2 Glossy	18.30—
No. 3 Glossy	17.60—
No. 4 Glossy	—
No. 2 Offset	14.60—
C1S Litho (Varnish)	—
C1S Litho (Non-Varnish)	—

Writing Papers—f.o.b. mill with zone, quantity, parking and other differentials allowed:

Rag Content Bond—	per cwt.
(In Ton Lots)	
Extra 100% Rag	52.30—
100% Rag	46.30—
75% Rag	36.70—
50% Rag	29.50—
25% Rag	26.35—

Rag Content Ledger—	per cwt.
(In Ton Lots)	
Extra 100% Rag	50.50—
100% Rag	44.50—
75% Rag	36.70—
50% Rag	29.50—
25% Rag	26.25—

Sulphite Bond—	per cwt.
Air dry, watermarked	—
No. 1 watermarked	18.50—
No. 2 watermarked	17.55—
No. 4 watermarked	16.85—

Sulphite Ledger—	per cwt. Zone 1
No. 1 watermarked	18.85—
No. 2 watermarked	18.05—
No. 4 watermarked	17.35—

Glassine (f.o.b. mill)—	per cwt.
Embossed (25 lbs. up)	—
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—
Greaseproof—	
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—

News—	per ton
Rolls, Standard (Contract)	100.00—
Rolls (Spot)	(Nominal)
Sheets	110.00—

Tissues (Carlots)—	per ream
White No. 1	1.85—
White No. 2	1.75—
Bleached Anti-Tarnish	—
Colored	—
Anti-Tarnish Kraft	1.85—
Manila	1.60—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.80—
Napkins, full crepe and emb'sed (12½ lb. to M shts.) per cs.	.80—
Toilet, Bleached (M. shts.) per cs	8.50 to 10.00
Toilet, Unbleached (M. shts.) per cs	8.50 to 10.00

Towels—	per case
Bleached	4.75—
Unbleached	4.00—

Wrappings (Kraft)—	per cwt.
Super-Standard	9.00 to—
No. 1 Wrapping	7.50 to 8.00
Standard Wrapping	7.00 to 7.25
Standard Bag	6.50 to 7.00
Variety Bag	—

Wrappings (Sulphite and Bleached Kraft)— (Rolls, f.o.b. mill)	
Bleached Papers—	per cwt.
M.F. & M.G. Waxing, 20 lb. (Carloads only (10,000 lbs.)	—
Drug wrapp., 35 lb.	—
Unbleached Papers—	
Com. Gr. Butch. 40 lb.	—
No. 1 Butchers	—
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	—
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	—
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Water Finish, 50 lb.	—
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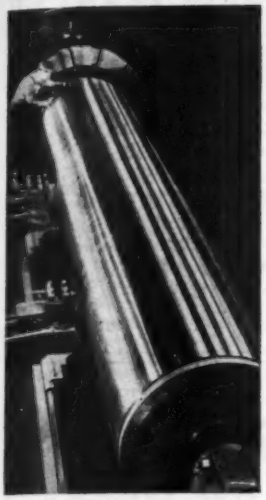
Envp. Mla., Sub. 16-28 (No. 2)	—
Envp. Mla. (Prices based on large sheets untrim'd ream-marked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	—
No. 2	—
M.G. Sulphite and Kraft (other than Waxing)	
Grade B20 lb.	—
Grade A-22 lb.	—



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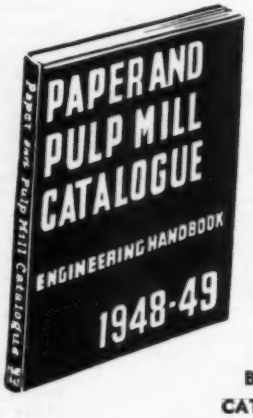

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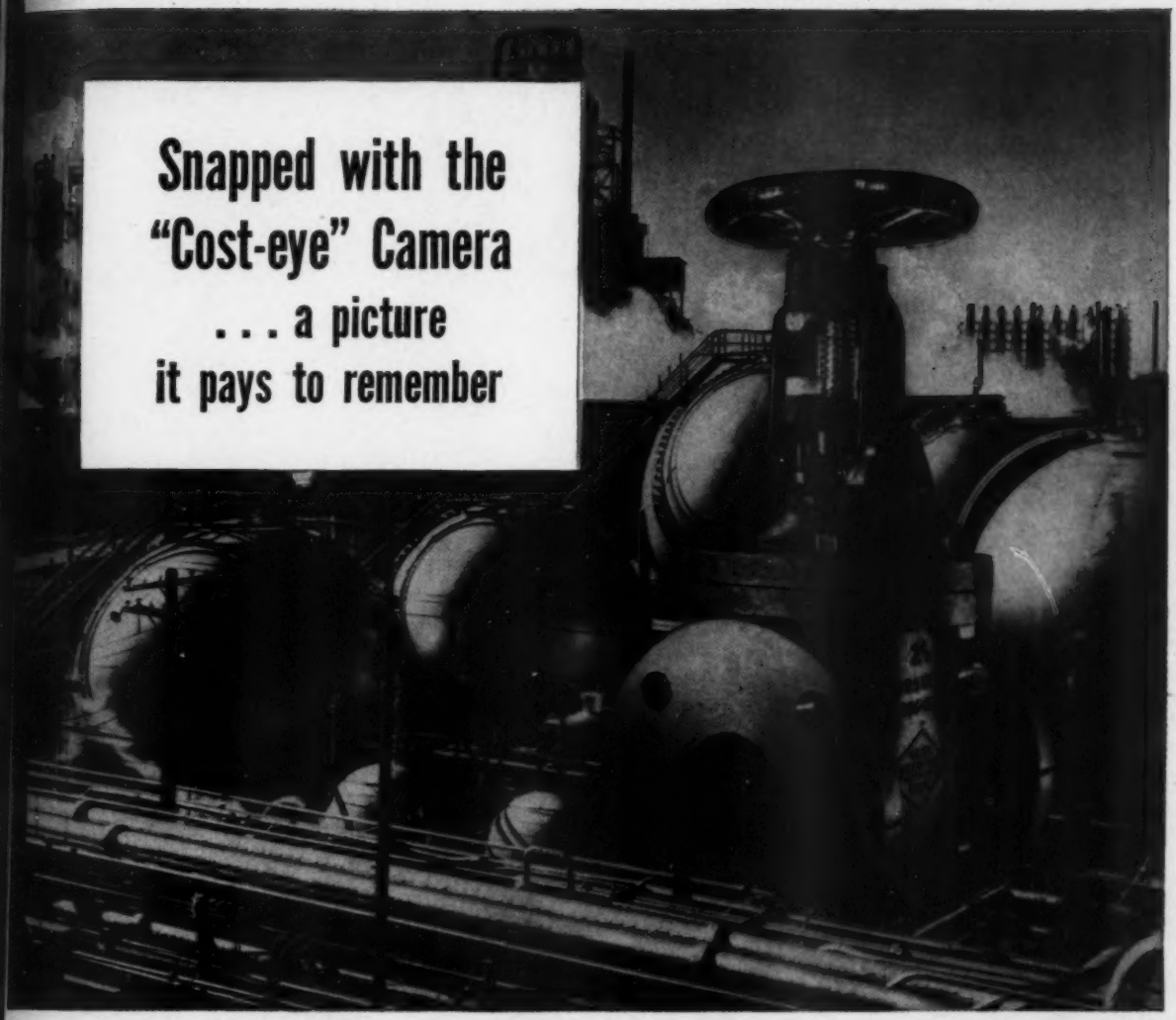

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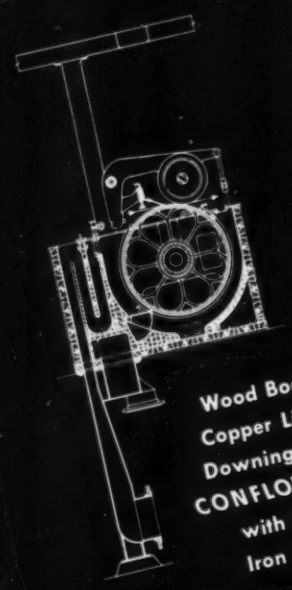
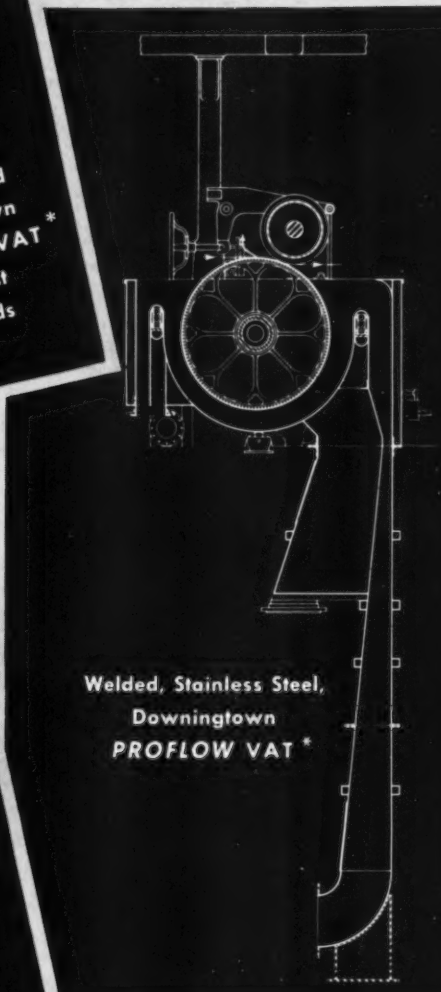
*PROFLOW** and CONFLOW* Vats

New Names for Established Principle

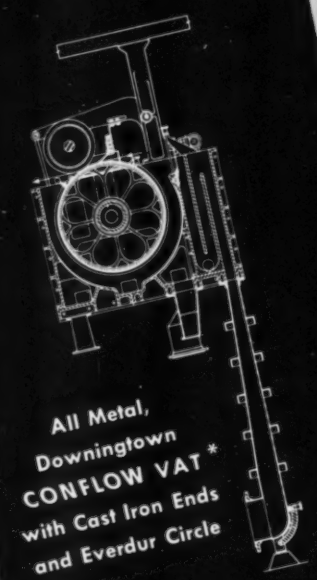


Wood Body, Copper Lined Downingtown CONFLOW VAT* with Cast Iron Ends



Welded, Stainless Steel, Downingtown *PROFLOW* VAT*

Welded, Stainless Steel, Downingtown CONFLOW VAT* with Suction Slice



All Metal, Downingtown CONFLOW VAT* with Cast Iron Ends and Everdur Circle

Fundamentally, there are just two types of board machine vats, o in which the direction of stock flow is "with" the rotat of the cylinder mould, and the other, in which the direction of st flow is "against" the rotation of the mould. Both types have been us for years, but the modern, improved Downingtown Designs in b types are different, so to identify them in the industry, we are nam them as follows: *PROFLOW* VATS* in which the direction of st flow is "with" and CONFLOW VATS* in which stock flow is "again the rotation of the cylinder moulds. Both types and designs of Downingtown Vats assure continuous p duction of a well formed sheet of uniform weight a caliper. Write us.

* TRADE MA

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Designers & Builders
Paper Making Machinery